DOCUMENT RESUME

ED 268 716 EC 182 320

AUTHOR Renzulli, Joseph S., Ed.
TITLE Technical Report of Research Studies Related to the Revolving Door Identification Model. 2nd Edition and Addendum. Research Report Series.
INSTITUTION Connecticut Univ., Storrs. Bureau of Educational Research and Service.
PUB DATE 84
NOTE 244p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Administrator Attitudes; Behavior Rating Scales; Creative Development; Elementary Secondary Education; *Gifted; Models; Productivity; Student Characteristics; Talent; *Talent Identification; Teacher Characteristics; *Teacher Role; Test Validity
IDENTIFIERS *Enrichment Triad Model; *Revolving Door Identification Model

ABSTRACT

Six studies are presented which investigate factors in implementing the Revolving Door Identification Model (RDIM) and the Enrichment Triad Model in gifted education for children in grades 1-8. In "An Analysis of the Productivity of Gifted Students Participating in Programs Using the Revolving Door Identification Model," S. Reis reports, among other results, a signficantly higher proportion of girls than boys in grades 1-6 who "revolved in" to complete advanced level investigations in a resource room for the gifted. J. Delisle concludes, in "The Revolving Door Identification and Programming Model: Correlates of Creative Production," that RDIM was effective statistically and in the practical realities of school operation. E. Gubbins reports quantitative and qualitative results on creativity and productive behavior in "Revolving Door Identification Model: Characteristics of Talent Pool Students." R. Kirshenbaum describes a study on a teacher rating scale of creativity, the Creative Process Inventory, in "The Incremental Validity of a Teacher Rating Scale in Identifying Creatively Productive Students." In "Administrators' Attitudes Toward Gifted Programs Based on the Enrichment Triad/Revolving Door Identification Model: Case Studies in Decision-Making," C. Cooper concludes that attitudes were shaped by the need for specific data and an appreciation for the program's integrity as measured by valued decision-making criteria. The final paper, "Facilitator of Learning: A Micro-Ethnographic Study of the Teacher of the Gifted" by C. Story suggests that successful teachers of the gifted must facilitate independent studies, possess the characteristics of good teachers in general, demonstrate highly developed management skills and exhibit competencies in inservice presentations. (CL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

6465

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Joseph S. Renzulli

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

A Technical Report of

Research Studies Related to

The Revolving Door Identification Model

Joseph S. Renzulli, Editor
2nd Edition, 1984

Bureau of Educational Research Report Series
School of Education
The University of Connecticut

Part I: An Analysis of the Productivity of Gifted Students Participating in Programs Using The Revolving Door Identification Model
By Sally M. Reis

Part II: The Revolving Door Model of Identification and Programming for the Academically Gifted: The Correlates of Creative Production
by James R. Delisle

Part III: Revolving Door Identification Model: Characteristics of Talent Pool Students
by E. Jean Gubbins

Part IV: The Incremental Validity of a Teacher Rating Scale in Identifying Creatively Productive Students
by Robert J. Kirschenbaum

This report is not copyrighted and readers are free to reproduce and distribute any and all sections for non-commercial purposes. Whenever sections are reproduced, a citation should be provided that includes the information on the cover page of this Technical Report.

EC 18 2320

INTRODUCTION: The Nature and General Purpose of This Report

This Technical Report represents one part of an ongoing series of research studies that have been carried out by persons in the Teaching the Talented Program at The University of Connecticut. The general purpose of the research has been to investigate various factors related to the implementation of The Revolving Door Identification Model (RDIM) and The Enrichment Triad Model in a number of school districts throughout the State of Connecticut. This edition of the Technical Report contains four studies dealing with (1) an analysis of the productivity of gifted students participating in Triad/RDIM programs and (2) an analysis of several non-cognitive correlates of creative production and (3) the characteristics of talent pool students. These studies were carried out during the 1981-82 school year in twelve school districts and involved more than eleven hundred students in grades one through eight.

The findings contained in this Technical Report are a summary of four extensive research studies and separate evaluation reports that were prepared for each of the participating school districts. Complete citations for these longer documents are listed in the section that follows entitled Research and Evaluation Report. Also included in the following section is a series of books and articles listed under the subheading, Books and Articles Dealing Strategies for Implementing Triad/Revolving Door Programs. Taken together, the present document as well as the several references listed on the following page, represent a complete set of materials for both developing Triad/RDIM programs and for providing supporting information about various factors relating to program effectiveness. We have included both full length books and reports as well as shorter versions of these major works so that persons making use of this model can select appropriate materials for particular target audiences. Thus, for example, administrators or school board members who may not have the time to read an entire book, will nevertheless, have access to shorter summaries for orientation purposes. This approach has been found to be useful in helping policy makers to "digest" important information in relatively short periods of time.

Persons interested in exploring the possible implementation of a Triad/RDIM program might want to bring this Technical Report to the attention of policy or decision makers at the state or local levels. The report is <u>not</u> copyrighted and readers are free to reproduce and distribute any and all sections for non-commercial purposes. Whenever sections are reproduced, a citation should be provided that includes the information on the cover page of this Technical Report.

Books and Articles Detailing
Strategies for Implementing Triad/RDIM Programs

I. Definition of Giftedness

Renzulli, J.S. What makes giftedness? A re-examination of the definition of the gifted and talented (Brief no. 6). Los Angelos:N-S LTI/GT, 1980.

Related Articles or Shortened Versions of the Above

Renzulli, J.S. What makes giftedness? Re-examining a definition. Phi Delta Kappan, 1978, 60, 180-184.

Renzulli, J.S. What makes giftedness? Re-examining a definition. Science and Children, 1979, 31, 16-21.

Renzulli, J.S. Dear Mr. and Mrs. Copernicus: We regret to inform you. Gifted Child Quarterly, Winter 1982, 11-14.

II. The Enrichment Triad Model

Renzulli, J.S. The enrichment triad model: A guide for developing defensible programs for the gifted. Mansfield Center, CT: Creative Learning Press, 1977.

Related Articles or Shortened Versions of the Above

Renzulli, J.S. The enrichment triad model: A guide for developing defensible programs for the gifted and talented. Gifted Child Quarterly, 1976, 20, 303-326.

Renzulli, J.S. The enrichment triad model: A guide for developing defensible programs for the gifted and talented, Part II. Gifted Child Quarterly, 1976, 21, 237-243.

Renzulli, J.S. and Smith, L.H. Developing defensible programs for the gifted and talented. Journal of Creative Behavior, 1978, 12, 21-30.

Renzulli, J.S. Will the gifted child movement be alive and well in 1990? Gifted Child Quarterly, 1980, 24, 3-9.

Reis, S.M. Tag serves the gifted and talented. Today's Education, February/March, 1981, 22-25.

Reis, S.M. Myth: The 'patch-on' approach to programming. Gifted Child Quarterly, Winter 1982, 29-31.

III. The Revolving Door Identification Model

Renzulli, J.S., Reis, S.M. & Smith, L.H. The revolving door identification model. Mansfield Center, CT: Creative Learning Press, 1981.

Related Articles or Shortened Versions of the Above

Renzulli, J.S., Smith, L.H. & Reis, S.M. Identifying and programming the gifted student. The Education Digest, March 1981, 45-47.

Renzulli, J.S., Smith, L.H. & Reis, S.M. The revolving door model: A new way of identifying the gifted. Phi Delta Kappan, May 1981, 548-549.

Renzulli, J.S. & Smith, L.H. Revolving door: a truer turn for the gifted. Learning, 1980, 8, 91-93.

Renzulli, J.D. & Smith, L.H. An alternative approach to identifying and programming for gifted and talented students. G/C/T, 1980, 15, 4-11.

Reis, S.M., & Renzulli, J.S. A research report on the revolving door identification model: A case for the broadened conception of giftedness. Phi Delta Kappan, 1982, 63, 619-620.

Delisle, J.R., Reis, S.M., & Gubbins, E.J. The revolving door identification model and programming model. Exceptional Children, October 1981, pp. 152-156.

IV. Developing IEP's for the Gifted and Talented

Renzulli, J.S. & Smith, L.H. Guidebook for developing individualized educational programs (IEP) for gifted and talented students. Mansfield Center, CT: Creative Learning Press, 1979.

Related Articles or Shortened Versions of the Above

Renzulli, J.S. & Smith, L.H. A practical model for designing individual educational programs (IEPs) for gifted and talented students. G/C/T, 1980, 11, 3-8.

Renzulli, J.S., Smith, L.H., & Reis, S.M. Curriculum compacting: An essential strategy for working with gifted students. Elementary School Journal, January 1982, 185-194.

Research and Evaluation Reports

Delisle, J.R. The Revolving Door Model of Identification and Programming for The Academically Gifted: The Correlates of Creative Production. Ann Arbor, MI: University Microfilm International, 1981.

Reis, S.M. An Analysis of The Productivity of Gifted Students Participating in Programs Using The Revolving Door Identification Model. Ann Arbor, MI: University Microfilms International, 1982.

Reis, S.M., & Renzulli, J.S. An Evaluation of Project Prism, Harwinton, Connecticut, 1981. (56 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of Project SAGE, Mansfield, Connecticut, 1981. (67 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of the Litchfield, Connecticut Talented and Gifted Program, 1981. (50 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of the Watertown Revolving Door/Triad Program, Watertown, Connecticut, 1981. (30 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of the Simsbury Revolving Door/Triad Program, Simsbury, Connecticut, 1981. (27 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation the Durham/Middlefield Triad Program, Durham, Connecticut, 1981. (25 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of the Ellington P.A.T. (Program for the Academically Talented), 1981. (37 pp.).

Reis, S.M., & Renzulli, J.S. An Evaluation of The Thompson Triad/ Revolving Door Program, Thompson, Connecticut, 1981. (30 pp.).

Gubbins, E.J. and Renzulli, J.S. An Evaluation of The Talented and Gifted (TAG) Program in Suffield, Connecticut, 1981.

Gubbins, E.J. and Renzulli, J.S. An Evaluation of The Extended Learning Program in Portland, Connecticut, 1981.

AN ANALYSIS OF THE PRODUCTIVITY OF GIFTED STUDENTS PARTICIPATING IN PROGRAMS USING THE REVOLVING DOOR IDENTIFICATION MODEL

Sally M. Reis, Ph.D.

The University of Connecticut

Introduction

In the past twenty years, programs for gifted and talented students have been implemented in increasing numbers across the United States. Unfortunately, many of these programs are of uncertain quality (Weiler, 1978; Remley, 1980; Renzulli, 1980). Criticism about them is often directed at the small number of students served and the identification procedures used to select those students and exclude others. Many of the criticisms center around certain definitions of giftedness and resulting identification systems which exclude 95-99% of the student population from participation in the gifted program based on predetermined intelligence test cut-off scores. Several states have designated an IQ of 130 as signifying giftedness in students. A student with an IQ of 130 is eligible for services in the gifted program; a student with an IQ of 129 is not.

Lewis Terman's longitudinal study of high IQ subjects in the 1920's influenced many definitions and resulting identification systems of gifted programs today (Terman, 1926; 1959). Many educators equate Terman's study of high IQ individuals with a single definition of giftedness. More recently, other researchers and educators have argued for the use of multiple criteria in the identification of gifted students (Marland, 1972; Passow, 1979; Male and Perrone, 1980). However in spite of the research and the intrinsic beliefs of many educators that current programs for the gifted and talented exclude large numbers of students who should be included, change has been a slow process. One need only survey most state guidelines for entrance into gifted programs to confirm the continued use of predetermined intelligence or achievement tests as the final, and usually major, criterion for student selection into gifted programs. Tennessee, Louisiana, Pennsylvania, and Florida all use predetermined intelligence test cut-off scores.

Recent studies of the definition of giftedness have emphasized a movement away from the notion that high IQ is synonymous with giftedness. A review of research by Renzulli (1978) suggests that the determination of *a priori* giftedness based upon predetermined scores may result in many above average students being deprived of educational services that can tap their potential. Through the analysis of research by MacKinnon (1965); Roe (1952) and others, Renzulli summarizes giftedness as the interaction of above average ability, task commitment and creativity brought to bear upon any potentially valuable area of human performance (Renzulli, 1978). Renzulli states that giftedness is recognized in expressed behaviors which are exhibited by a relatively larger proportion of the general population than is usually identified in gifted programs. Gifted behaviors, then, are exhibited by certain above average ability individuals, at certain times, in certain situations and under certain circumstances.

Until recently, however, no system of identification has been used that can efficiently identify this larger proportion of the general population and subsequently offer programming suggestions. This study was undertaken to analyze the use of a new identification system, the Revolving Door Identification Model (RDIM) (Renzulli, Reis, Smith, 1981), which was substituted for the more traditional method of identification in twelve school districts throughout Connecticut. The purpose of this study was to develop a product rating scale which could be used to examine differences in the quality of products completed by male and female students in the gifted programs in these districts. Students were divided into two groups: female and male students who would have been identified by traditional guidelines (The top one to five percent as selected by high scores on an achievement or IQ test), and female and male students who would not have been traditionally identified but who entered the program under an expanded set of criteria. Additionally, the study analyzed whether sex or grade level affected the process of students "revolving in" to complete products. This study also analyzed the effects of implementing the RDIM system, which identifies approximately fifteen to twenty-five percent of the student population as being eligible to participate in the gifted program.

This study also addressed a critical issue often ignored in the education of the gifted: the simple fact that the number of men who are recognized as creative producers in our society totally overshadows the number of females so identified (Callahan, 1979). An examination of why so few adult women realize their goals and potential when compared to an equal number of men is necessary and lacking in the literature. No direct comparisons of achievement motivation of gifted male and female students were available, so this study was an initial attempt to examine motivation for creative productivity ("revolving in") between male and female students in a gifted program.

Research Methods and Procedures

The research methods and procedures have been divided into two sections. In the first section, all information related to the development of the Student Product Assessment Form (Renzulli and Reis, 1981) is reviewed. A description of the results obtained from content validation procedures is provided, as are reliability findings, scoring techniques and interrater agreement and reliability techniques employed. The second section is devoted to a two year research study undertaken to assess the feasibility of the implementation of the RDIM and to analyze the quality of products completed by males and females who would have been traditionally selected for inclusion in a gifted program and those who were selected under the expanded guidelines of RDIM. The second section includes a review of the sampling procedures, instrumentation, data collection, and data analyses employed in the investigation of the study's research questions.

Development of the Student Product Assessment Form

Content Validity

Description of the Student Product Assessment Form

The first stage in the development of the Student Product Assessment Form (SPAF) was to outline the content around which the instrument was to be constructed. Toward this end, a review of literature (Tuttle (1980), Callahan (1980), Archambault and Gubbins (1981)) was undertaken in an effort to identify methods of evaluating student products completed in gifted programs. A shortage of instruments designed for this purpose was found. Few of the instruments available had been evaluated in terms of reliability, validity or field test research. Additionally, all available forms and scales that were examined were thought to be sketchy, inadequate and incomplete for use in this study.

Based upon the examination of the literature, a new form was designed, the Student Product Assessment Form (SPAF) (Renzulli and Reis, 1981) to provide raters with a valid and reliable basis for assessing the quality of products completed in gifted programs.[1] Fifteen items were generated which assess both individual aspects as well as the overall excellence of the product. Although at first glance the items on the SPAF seem long, they are actually quite concise. Each item

[1]This instrument, as well as all other instruments described in this technical report, are included in the book entitled The Revolving Door Identification Model, (Renzulli, Reis & Smith) Creative Learning Press, P. O. Box 320, Mansfield Center, CT 06250.

represents a single characteristic on which raters should focus their attention. Items 1 through 8 are divided into the three related parts:

1. The Key Concept. This concept is always presented first and is printed in large type. It should serve to focus the rater's attention on the main idea or characteristic being evaluated.

2. The Item Description. Following the Key Concept are one or more descriptive statements about how the characteristic might be reflected in the student's product.

3. Examples. In order to help clarify the meaning of the items, an actual example of students' work is provided. These examples are intended to elaborate upon the meaning of both the Key Concept and the Item Description. The examples are presented in italics following each item description.

Item 9 has seven different components which deal with an overall assessment of the product. No examples of students' work are provided for item 9. When completing the ratings for the overall assessment of a student's product, raters should attempt to evaluate the product in terms of their own values and certain characteristics that indicate the quality, esthetics, utility and function of the overall contribution In other words, raters are encouraged to consider the product as a whole (globally) in item 9 and to use their own judgment and rely upon their own guided subjective opinions when rating this item.

Because of the difficulty of developing a single instrument that will be universally applicable to all types of products, there will occasionally be instances when some of the items do not apply to specific products. For that reason, a category entitled "Non-Applicable" was added to the 1-5 Likert-type scale for items 1-8. For example, in a creative writing product (play, poem, novel) either the Level of Resources (item 3) or the Diversity of Resources (item 4) might not apply if the student is writing directly from his/her own experiences. This Non-Applicable category should be used very rarely in most rating situations and was not included in the overall assessment of the product (item 9) which uses a 1-4 Likert-type scale.

To further examine content validity, the form was submitted for evaluation by several recognized national authorities in the field of education of the gifted as well as in the area of educational research. It was further distributed to twenty experienced teachers of the gifted in Connecticut. The authorities were asked to carefully assess the content of the form for omissions, clarity, and duplications. They were also asked for suggestions which would improve the form. Very few suggestions or omissions were mentioned by the experts in the field and the form was accordingly, modified only very slightly.

Reliability

Interrater Agreement

Interrater agreement was determined in two separate phases. In the first phase, 19 raters with familiarity to the field of education of the gifted (many of the raters were resource room teachers of the gifted) rated a research book on skunks, the product of a first grader. The percentage of interrater agreement on the items during the first and second phases is summarized in Table 1.

Prior to phase two, the Student Product Assessment Form was revised according to interrater agreement percentages of the phase one field test. In phase two, 22 raters (19 of the phase one group and three additional teachers of the gifted) rated a second product (an original historical walking tour of a Connecticut city) and a third product (a novel about a slave boy written by a sixth grade student). On the second product, interrater agreement of 100% was achieved for twelve of the fifteen items. The other three items achieved agreement percentages of 86.4, 90.9 and 95.5. Due to the nature of the third product (i.e., the novel) it was more difficult to attain interrater agreement above 80% in two areas (See Items 3 and 4, SPAF. However, all other agreement percentages were above 80%.

Stability

An additional consideration addressed was the extent that ratings would be stable over time. Stability reliability was determined by having the same raters assess product two (the historic walking tour) approximately two weeks after the first assessment. Almost identical responses and percentages were recorded. A correlation of +.96 was achieved between the first and second assessment of product two.

Interrater Reliability

A final phase of the reliability check was the generation of interrater reliabilities for 20 different products listed in Table 2. The products represented five different product types including Scientific (N = 7), Creative Writing (N = 5), Social Studies (N = 5), Audio-Visual (N = 2) and Inter-disciplinary (N = 1). The products were submitted for assessment by three public school programs for gifted students in Connecticut. Four experienced teachers of the gifted were asked to evaluate the products using the Student Product Assessment Form.

The products varied in format, subject matter, age of the student who completed them, and final form. Some products were accompanied by a completed management plan (a contract-like form used in many programs for the gifted, (See Figure 5)). Other products were accompanied by the completed student guide that is an optional segment of the Student Product Assessment Form.

Table 1

Percentage of Interrater Agreement on the

Student Product Assessment Form

				After Revision						
ITEM #	Product #1			Product #2			Product #3			
	5-4	3	2-1	5-4	3	2-1	5-4	3	2-1	NA
1	100.0			86.4	13.6		90.9	9.1		
2	63.2	26.3		100.0			86.4	9.1		4.5
3	94.7	5.3		90.9	9.1		68.2	27.3	4.5	
4	89.4	5.3	5.3	95.5	4.5		54.5	27.3	9.1	9.1
5	100.0			100.0			77.3	18.2		4.5
6	68.4	21.0	5.3	100.0			81.8	13.6		4.5
7	63.2	15.8	21.0	100.0			95.5	4.5		
8	94.7		5.3	100.0			90.9	9.1		
9	4-3		2.1	4-3		2-1	4.3		2.1	
A	78.9		21.0	100.0			95.5			4.5
B	100.0			100.0			100.0			
C	94.7		5.3	100.0			100.0			
D	100.0			100.0			100.0			
E	100.0			100.0			100.0			
F	100.0			100.0			100.0			
G	100.0			100.0			100.0			

Table 2

Listing of Products by Type Used to Generate Interrater Reliability

Type		
4	1.	A weekly television show, "All kinds of Kids" which is directed, produced and filmed by a group of gifted students.
1	2.	A filmstrip on topology.
2	3.	A short story.
1	4.	A non-fictional book on pond life in Connecticut.
1	5.	A book on skunks.
3	6.	A geneological investigation of a family and resulting book.
1	7.	A scientific investigation of mapping-pond life resulting in a photo essay and book.
3	8.	An historical investigation and recreation of the "Battle of the Bulge".
1	9.	A model Solar home.
1	10.	A reflector telescope.
5	11.	A filmstrip on computers and their history.
3	12.	A study on the attitudes of school and community towards the E.R.A.
3	13.	An historical walking tour of a city.
2	14.	A short novel.
2	15.	An autobiographical creative writing effort.
3	16.	An investigative study of a political issue in a community.
2	17.	A book of poety.
2	18.	A novel entitled Slave Boy.
1	19.	A solar collector.
4	20.	A documentary film on sign language.

[a]Scale for Types of Products

1 - Scientific
2 - Creative writing
3 - Social Studies
4 - Audio-visual
5 - Interdisciplinary

To obtain the interrater reliabilities, the technique described by Ebel (1951) was utilized which essentially intercorrelates the ratings obtained from different raters as the approach to the reliability of ratings (See Guilford, 1954, pp. 395-397). The ratings of the four separate raters were correlated for each item presented in the SPAF as well as on the subtotals of Items 1 through 8, Items 9 A-G, and on the total rating of the items. Since each of the raters rated 20 products on 15 different traits, intercorrelations of the rating of the products from all possible pairs of raters were obtained. The data in Table 3 represent the interrater reliability results of the mean reliability for one rater as well as four raters, on the nine different items. Also included are the subtotals and total rating of the Student Product Assessment Form.

It should be noted that two key concepts, Audience and Original Contribution, had much lower reliability when evaluated by one rater than when evaluated by four raters. Since the rating scale will most likely be employed by single raters in the future, those two areas will need further examination.

The high interrater reliability should be examined with the realization that the products submitted for evaluation were from three outstanding programs for gifted and talented students. The teachers who submitted products chose them for their superior quality in several instances. It could be that less superior products will be associated with lower reliabilities. Future data needs to be collected in this area.

In summary, this section has described the development of the Student Product Assessment Form. Content validity procedures were presented and reliability assessments (interrater agreement, stability and interrater reliability) were described. It was concluded that the rating form could be reliably employed to rate the quality of gifted students in this research study.

The Two Year Research Study
An Analysis of the Effects of Implementing RDIM

During the first year of this research study, RDIM was field tested in one school in northwestern Connecticut. As a result of that field test experience, some of the procedures in the model were revised and modified. Several new forms were developed for use in the implementation of the model including the Student Product Assessment Form.

During the second year of this research study, RDIM was implemented in 11 additional school districts in Connecticut.* Although the

*One school district implemented RDIM only at the senior high school level, therefore only 11 districts were used in the study.

Table 3

Student Product Assessment Form

Interrater Reliability of One Rater and Four Raters on Individual Items and Totals[a]

Items	1 Rater	4 Raters
1. Early Statement of Purpose	1.000	1.000
2. Problems Focusing	1.000	1.000
3. Level of Resources	.973	.993
4. Diversity of Resources	.963	.990
5. Appropriateness of Resources	.983	.996
6. Logic, Sequence and Transition	.779	.934
7. Action Orientation	.913	.977
8. Audience	.533	.820
Subtotal Key Concepts 1 - 8	.994	.998
9. Overall Assessment		
A. Originality of the Idea	.778	.933
B. Achieved Objectives Stated in Plan	.789	.937
C. Advanced Familiarity with Subject	1.000	1.000
D. Quality Beyond Age/Grade Level	.912	.971
E. Care, Attention to Detail, etc.	1.000	1.000
F. Time, Effort, Energy	.875	.966
G. Original Contribution	.390	.718
Subtotal Key Concepts 9A-G	.924	.980
Total of All Items on SPAF	.961	.990

[a]Note that these data are based upon twenty products rated by four people.

percentage of students identified in the Talent Pool is in conflict with existing State guidelines for the education of gifted students, the Connecticut State Department of Education waived those guidelines for the 12 districts who agreed, in writing, to participate in this research study.

Population

The population for this study consisted of groups of students identified as being in the top 15 to 25% academically of the grades being served by the gifted program. This group was called the Talent Pool and student eligibility was determined by either one of the following two criteria:

1. Achievement tests scores (generally total local battery) of the 80%ile (districts used either the 75%ile to the 85%ile) or above or group IQ scores at the 80%ile or above, using local norms: or

2. Teacher nomination

Additionally, students were able to be considered for eligibility in the Talent Pool by alternate pathways. These pathways required a case study to be completed on individual students and did not guarantee automatic entrance to the Talent Pool. They included:

1. Parent nomination
2. Self nomination
3. Peer nomination
4. Tests of special aptitude
5. Product ratings

Although participating districts in this study used a variety of achievement and IQ tests, each town utilized well-known, nationally standardized instruments (i.e., Iowa Tests of Basic Skills, California Achievement Tests, Otis-Lennon Mental Ability Test). Teachers who nominated students completed a nomination form (See Appendix H) and filled out The Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS) (Renzulli, Hartman, Callahan, 1972). SRBCSS were the only scales available for teacher use which had been empirically examined for use with above average students. This instrument has been found to be both valid and reliable over time when used by different raters. For this reason it was selected for use in the present study.

Students in the population represented grades K-6. Table 4 delineates each field test district's grade levels involved in the study, as well as the number of Talent Pool students participating from among the respective districts. The sample included students from a variety of demographic and ethnic backgrounds, with the twelve participating towns representing rural, urban and suburban regions throughout Connecticut.

Table 4

Demographics of Population/Sample

District	Contact Person	Grade Level	Number of Pupils
1. Burlington	Cheryl Klozcko	4-6	94
2. Durham	Pat Myers	1-5	33
3. Ellington	Tom Prescher	5	53
4. Thompson	Laurie Rysk	1-4	68
5. Harwinton	Peg Cellerino	4-6	75
6. Mansfield	Betty Shibles	1-4	130
7. Watertown	Gerald Kohn	1-5	130
8. Litchfield	Michael Malley	1-6	149
9. Simsbury	Pat Ciabotti	4-6	43
10. Torrington	Sally Reis	1-6	286
11. Suffield	Martha Simpson	4-6	101
		Total =	1,162

For the purpose of data analysis, students in the population were subdivided into two grade level classifications: grades 1 - 3 (N = 427), grades 4 - 6 (N = 736). This accommodation was necessary because of the logistical problems that arise in providing different services to different age levels. It also permitted a comparison of the "revolving in" process across age levels. The entire population was used to determine frequency and sex of students who "revolved in" for services. All students who completed products will be used as the sample for individual product assessment.

Instrumentation

The instrument used to evaluate products completed by students in the RDIM programs was the Student Product Assessment Form which was described earlier in this chapter.

Three evaluation instruments were designed to obtain feedback from parents, students and classroom teachers on the implementation of RDIM. Each instrument was developed around a number of key concepts that are implicit within the model or that become apparent as a result of interviews with cross sections of the groups for whom the instruments were designed during the first year of research.

Parent Questionnaire

The Parent Questionnaire includes 20 items that are either open-ended or of the type that may be answered by checking yes/no or a Likert-type scale which ranges from often to never. The major factors for which evaluative data were sought through the use of parent questionnaires were: communication with parents, parental perception of student enthusiasm, effect of work in the gifted program on work in the regular classroom, the level of difficulty of the work in the gifted program and attitudes toward RDIM.

Student Questionnaire

The Student Questionnaire included 12 items with response options similar in format to the parent questionnaire. The major factors for which evaluative data were sought through the use of the student questionnaire were: types of experiences in the gifted program, skills that were learned in the program, student enthusiasm about the program, level of satisfaction on work completed in the program, and attitudes towards RDIM.

Classroom Teacher Questionnaire

The Classroom Teacher Questionnaire included 25 items. The response options are similar in format to the parent and student questionnaire. The major factors for which evaluative data were sought through the use of the teacher questionnaire were: familiarity with the program model and procedures, classroom teacher perceptions of student enjoyment, classroom teacher perceptions of student enthusiasm and attitudinal change, and the effect of work in the gifted program on work in the regular classroom.

Principal's Incident Report

Another instrument that was used to help determine the effects of implementing RDIM was the Principal's Incident Report. The Principal's Incident Report was also developed during the first field test year of research and its primary purpose was to maintain a record of critical administrative incidents and concerns related to the RDIM program. Although a record of such incidents should also be maintained by resource and classroom teachers, the Principal was considered to be a key person in determining the effectiveness of RDIM because he or she was often the person contacted when various types of problems occurred. The Principal's Incident Report simply provided spaces for the building principal to indicate the date and time of the incident, the persons involved, a brief description of the incident and the outcome or action taken.

Resource Room Monthly Report Form

Another instrument that was developed in the first year field test was the Resource Room Teacher's Monthly Report Form. This instrument was used in the second year of research to monitor various practices that were deemed necessary for the implementation of the model. The

form has ten parts and was designed to be completed by each resource room teacher of the gifted in every field test site. The form was developed to gather evaluative data on the types of enrichment experiences being offered to Talent Pool students, the number of students involved in advanced level enrichment, and any concerns on problems related to the implementation of RDIM.

Data Collection Procedures

In each of the 11 participating school districts, one person (i.e. program coordinator, teacher, or principal) was designated as the main contact for purposes of data collection. At a meeting in the fall of the implementation year for RDIM, the various forms and information gathering material were distributed to the contact persons. Subsequently, contact persons in the field test districts furnished the names, ages, sex and test score information of all Talent Pool students. These lists were periodically updated throughout the year.

Each resource room teacher in the field test districts was asked to complete a monthly report form which was submitted to the University of Connecticut research team. Twice during the second field test year, principals from each district were asked to submit their Principal's Incident Report Form. Each resource room teacher in every district was also asked to complete Student Product Assessment Forms on each student who had finished an individual or small group product. The questionnaires for parents, teachers and students were distributed at the conclusion of the 1980-1981 school year.

The contact persons from the field test districts also met periodically during the year to discuss the implementation of RDIM with the University research team. Several site visits were also carried out as a part of this study.

Analysis of Data

The first analysis strategy consisted of generating the significant difference between two independent proportions (See Hinkle pp. 216-217). The separate relationships between sex (male, female) and age (1-3 graders, 4-6 graders) and the frequency of "revolving in" to complete an advanced level product in the resource room were generated.

A two-way analysis of variance (ANOVA) procedure was used to determine if significant differences or interactions existed between sexes (male, female) and identified group with respect to the quality of the student's product as measured by the Student Product Assessment Form. Group, as indicated earlier, refers to whether the student was traditionally identified as being eligible for services in the gifted program (i.e., the top five percent) or whether the student was not identified in the traditional manner but was included in the program under the expanded guidelines of RDIM.

These analyses enabled the examination of the following two research questions:

1. To what extent and in what manner does the age and sex of talent pool students affect the frequency in the process of "revolving in" to the resource room to engage in advanced level investigations?

2. Is there a significant difference in the quality of products completed by male and female students in a gifted program who would have been identified according to traditional guidelines (the top 1-5% as usually selected by high scores on group achievement or IQ tests) and those male and female students eligible for inclusion under the guidelines of the Revolving Door Identification Model?

The third research question in this study was not addressed by statistical procedures. Instead, qualitative research techniques were combined with quantitative techniques which resulted in the methodological combination effect known as triangulation. Participant observation, the use of documentation (questionnaires, reports and product ratings) and field site visits and interviews were all utilized during the two year pilot study of the implementation of RDIM. As a part of this study, a complete evaluation report was written for each field test district. In order to complete these reports, the following procedures were followed. All of the questionnaires (parent, teacher and student) were tabulated. The frequency of responses were tallied for all of the questions that could be answered by a choice of one of several pre-determined responses. All of the responses to the more qualitatively open-ended questions were also recorded, categorized and evaluated. All of the Resource Room Teachers Monthly Report Forms were carefully studied and all Principal's Incident Reports were reviewed. The Student Product Assessment Forms which were submitted at the end of the 1980-1981 year, were also examined. A summary form was designed and sent to each district asking program personnel to take part in a self-assessment of various aspects of their RDIM program. Additionally, all field site visit notes were reviewed.

At the conclusion of the process of writing evaluative reports for the districts, certain key features emerged as being necessary for the successful implementation of RDIM. These features will be discussed in a later section. This combination of quantitative and qualitative research methodology enabled the examination of the third research question that was addressed:

3. In what manner and to what extent does the implementation of the Revolving Door Identification Model affect the attitudes of students, teachers, and administrators who interact with the gifted program as measured by Student, Teacher, and Parent Questionnaires, Teacher Monthly Report Forms, Principal Incident Report Forms, interviews, and site visits and observations?

Results of the Study

This section will report the results of comparing the proportions of males and females as well as various age levels regarding student entrance into advanced level products. It will also report the results of the analysis of variance procedures carried out to determine if a significant difference existed in the quality of products completed by the two sexes of the two different groups examined in this study.

Additionally, a discussion of the results obtained through an analysis of the attitudinal changes of students, teachers, parents and administrators involved in the RDIM through a combination of quantitative and qualitative methods will be presented.

Proportions of Students of Different Sexes and Grade Levels Who Revolved in to Complete Advanced Level Products

As can be seen in Table 5, the bold boxes in the upper section contain the proportion of males and females who "revolved in". The Z statistic generated to compare the two proportions was -2.07 (p .05). A significantly higher proportion of females revolved in to complete advanced level products than males.

As can be seen in Table 6, the bold boxes in the upper section contain the proportion of 1-3 and 4-6 grade students who "revolved in". The Z statistic generated to compare the two proportions was -4.96 (p .05). A significantly higher proportion of 4-6 grade students revolved in to complete advanced level products than 1-3 grade students.

Analysis of Variance Results

Analysis of variance procedures were carried out to determine if a significant difference existed in the quality of products completed by male and female students in a gifted program who would have been traditionally identified (the top 5%) and those male and female students eligible for inclusion under the expanded guidelines of the RDIM (the next 15-20%). The outcome of these analyses is outlined below.

As was discussed earlier, the quality of products completed by students was assessed by their resource room teacher of the gifted through the use of the Student Product Assessment Form.

Table 5

Frequency, Percentage and Proportion of Male and Female Students Who "Revolved In" To Complete an Advanced Level Product

	Male	Female	Total
Revolved in	n - 179 percentage = 15.4 proportion = 32.7	n = 239 percentage = 20.6 proportion = 38.9	n = 418 percentage = 36.0
Did not Revolve in	n = 369 percentage = 31.8 proportion = 67.3	n = 375 percentage = 32.3 proportion = 61.1	n = 744 percentage = 64.0
Total	n = 548 percentage = 47.2	n = 614 percentage = 52.8	n = 1162

Table 6

Frequency, Percentage and Proportion of Different Grade Level Students (1-3, 4-6) Who "Revolved In" To Complete an Advanced Level Product

	Grades 1-3	Grades 4-6	Total
Revolved in	n = 120 percentage = 10.3 proportion = 28.1	n = 298 percentage = 25.6 proportion = 40.5	n = 418 percentage = 36.0
Did not Revolve in	n = 307 percentage = 26.4 proportion = 71.9	n = 437 percentage = 37.6 proportion = 59.9	n = 744 percentage = 64.0
Total	n = 427 percentage = 36.7	n = 735 percentage = 63.3	n = 1162

A mean was obtained for each of the key concepts and for the sub-totals of key concepts 1-8, 9A-G, and finally, for the total of all of the key concepts. As can be seen in Table 7, an analysis of variance on these data revealed that, as assessed by resource room teachers of the gifted using the Student Product Assessment Form, the quality of products completed by students in the two groups was indistinguishable on every individual key concept and on the total of all of the items. In fact, as can be seen in Table 7, the mean score of the total of all of the key concepts was slightly higher for students who would not have been identified (Group B) and therefore, would not have participated in the traditional gifted program in their district. Higher mean scores for Group B were also obtained on key concepts 3, 4, 8, 9A, 9B, 9D, 9E, 9F, and 9G, s well as for the subtotals of key concepts 1-8 and 9A-G.

An analysis of variance was carried out to determine if a significant difference existed in the quality of products completed by males and females. As can be seen in Table 8, an analysis of variance on these data revealed that no significant difference was found in sub-totals 1-8, 9A-G, or in the total of all of the key concepts (1-9G) on the Student Product Assessment Form. However, significant differences were found between males and females on key concept #1 (Early Statement of Purpose) and on key concept #9B (Achieved Objectives Stated in Plan). On both of those key concepts, females were rated significantly higher than their male counterparts by their resource room teacher. Thus, as assessed by their resource room teachers using the Student Product Assessment Form, the quality of products completed by male and female Talent Pool students was mostly indistinguishable.

An analysis of variance procedure on these data also revealed that interactions between sex and group with respect to the quality of products existed for the total of the key concepts, as well as for key concepts #2 (Problem Focusing), #6 (Logic, Sequence and Transition), #7 (Action Orientation), #8 (Audience) and #9G (Original Contribution) and the sub-total of key concepts 1-8.

The interaction of the total of items 1-9G on the Student Product Assessment Form shows that the highest product quality ratings were found for females who were traditionally identified (usually the top 5%) and for males who were identified under the expanded guidelines of the RDIM (next 15-20%). Follow-up t-tests were used to examine differences between groups within each of the respective sexes. A significant difference was found between males and females in Group A (the traditionally identified top 5%) on Key Concepts #6 (Logic, Sequence and Transition), #7 (Action Orientation), and #8 (Audience). However, when the total of all of the Key Concepts was examined, no significant differences were found between males and females in Group A. No significant differences were found between males and females in Group B (those identified under the expanded guidelines of the RDIM) on any of the individual Key Concepts or on the total of all of the Key Concepts.

Table 7

Group Differences on the Quality of Advanced Level Products Completed by Talent Pool Students

Key Concept on the Student Product Assessment Form	Group A (Top 5%) n - 112[a] Mean	Standard Deviation	Group B (Next 15-20%) n - 214[a] Mean	Standard Deviation	F-Ratio	Significance of F*
1. Early Statement of Purpose	4.41	.87	4.34	.81	.389	.533
2. Problems Focusing	4.17	1.01	4.11	.94	.206	.650
3. Level of Resources	3.38	1.22	3.46	1.19	.234	.629
4. Diversity of Resources	3.20	1.29	3.28	1.24	.278	.599
5. Appropriateness of Resources	3.84	1.19	3.83	1.12	.001	.970
6. Logic, Sequence, and Transition	3.96	1.07	8.83	1.10	1.120	.290
7. Actior Orientation	4.14	1.12	4.14	1.01	.002	.967
8. Audience	4.06	1.28	4.11	1.06	.199	.565
Subtotal Key Concepts 1-8	3.92	.87	3.93	.83	2.81	.095

[a]The n's vary slightly on each key concept due to non-applicable items which were checked on the Student Product Assessment Form, and subsequently coded as missing values.

*P < .05.

BEST COPY AVAILABLE

Table 7 continued

Group Differences on the Quality of Advanced Level Products
Completed by Talent Pool Students

Key Concept on the Student Product Assessment Form	Group A (Top 5%) n = 112[a] Mean	Standard Deviation	Group B (Next 15-20%) n = 214[a] Mean	Standard Deviation	F-Ratio	Significance of F*
9. Overall Assessment						
A. Originality of the Idea	3.10	.83	3.05	.87	.295	.587
B. Achieved Objectives Stated in Plan	3.29	.89	3.33	.83	.183	.669
C. Advanced Familiarity with Subject	3.19	.88	3.06	1.06	1.569	.211
D. Quality Beyond Age/Grade Level	2.96	.89	2.97	.92	.004	.952
E. Care, Attention to Detail, etc.	2.92	.98	3.02	.94	.922	.338
F. Time, Effort, Energy	3.04	1.03	3.20	.87	2.280	.132
G. Original Contribution	3.08	.93	3.11	.92	.035	.852
Subtotal Key Concepts 9A-G	3.07	.76	3.11	.72	.136	.713
Total Key Concepts 1-9G	3.51	.79	3.53	.73	.078	.780

[a]The n's vary slightly on each key concept due to non-applicable items which were checked on the Student Product Assessment Form, and subsequently coded as missing values.
*p < .05.

Table 8

Sex Differences on the Quality of Advanced Level Products Completed by Talent Pool Students

Key Concept on the Student Product Assessment Form	Group A (Boys) n = 131[a] Mean	Standard Deviation	Group B (Girls) n = 196[a] Mean	Standard Deviation	F-Ratio	Significance of F
1. Early Statement of Purpose	4.24	.90	4.44	.77	4.38	.037*
2. Problems Focusing	4.06	.95	4.18	.97	.903	.343
3. Level of Resources	3.50	1.19	3.36	1.20	.984	.322
4. Diversity of Resources	3.24	1.31	3.25	1.22	.000	.997
5. Appropriateness of Resources	3.83	1.15	3.83	1.14	.004	.948
6. Logic, Sequence, and Transition	3.80	1.08	3.90	1.12	.393	.531
7. Action Orientation	4.09	1.09	4.16	1.04	.111	.739
8. Audience	3.97	1.27	4.19	1.04	3.12	.078
Subtotal Key Concepts 1-8	3.86	.83	3.96	.85	1.14	.286

[a]The n's vary slightly on each key concept due to non-applicable items which were checked on the Student Product Assessment Form, and subsequently coded as missing values.

*P < .05.

Table 8 continued

Sex Differences on the Quality of Advanced Level Products Completed by Talent Pool Students

Key Concept on the Student Product Assessment Form	Group A (Boys) n = 131[a] Mean	Standard Deviation	Group B (Girls) n = 196[a] Mean	Standard Deviation	F-Ratio	Significance of F*
9. Overall Assessment						
A. Originality of the Idea	2.99	.93	3.06	.80	.366	.546
B. Achieved Objectives Stated in Plan	3.20	.89	3.39	.81	7.16	.042*
C. Advanced Familiarity with Subject	3.21	1.00	3.03	.93	3.64	.057
D. Quality Beyond Age/Grade Level	2.97	.99	2.95	.86	.059	.807
E. Care, Attention to Detail, etc.	2.94	1.01	3.01	.92	.324	.570
F. Time, Effort, Energy	3.06	1.01	3.19	.88	1.43	.233
G. Original Contribution	3.12	.99	3.08	.88	.288	.592
Subtotal Key Concepts 9A-G	3.08	.78	3.10	.71	.070	.791
Total Key Concepts 1-9G	3.49	.76	3.54	.74	.337	.562

[a]The n's vary slightly on each key concept due to non-applicable items which were checked on the Student Product Assessment Form, and subsequently coded as missing values.
*P < .05.

Table 9

Analysis of Variance Results on the Interaction Between Sex and Group on the Quality of Advanced Level Investigations

Key Concept on the Student Product Assessment Form	F Ratio	Significance of F*
1. Early Statement of Purpose	.656	.419
2. Problems Focusing	4.30	.039*
3. Level of Resources	2.23	.136
4. Diversity of Resources	.001	.979
5. Appropriateness of Resources	2.87	.091
6. Logic, Sequence, and Transition	5.43	.020*
7. Action Orientation	7.17	.008*
8. Audience	7.51	.006*
Subtotal Key Concepts 1-8	4.34	.038*
9. Overall Assessment		
A. Originality of the Idea	.018	.894
B. Achieved Objectives Stated in Plan	.084	.773
C. Advanced Familiarity with Subject	.955	.329
D. Quality Beyond Age/Grade Level	3.60	.059
E. Care, Attention to Detail, etc.	3.22	.074
F. Time, Effort, Energy	2.95	.087
G. Original Contribution	4.49	.035*
Subtotal Key	2.58	.109*
Total Key Concepts 1-9G	2.15	.050*

*P < .05

Analysis of the Effects of the Implementation of RDIM on Students, Teachers, Parents and Administrators

The instruments that were developed to evaluate various aspects of RDIM were discussed earlier. These instruments were designed to provide information for both formative and summative evaluation information. The formative evaluation model is intended to discover problems, deficiencies and successful program practices at intermediate stages in the operation of a program. In other words, the main purpose of formative evaluation is to provide feedback that will lead to modifications in the operation of a program throughout the course of the school year. The formative model helps to prevent educators from letting an entire year go by before changes are initiated that appear to be warranted in view of evaluation data. One of the primary advantages of formative evaluation is that the data are gathered in close proximity to specific components of a program and thus it has greater potential for pinpointing the successes and failures of particular program activities.

Summative evaluation differs from formative evaluation mainly in the role that it fulfills. Whereas formative evaluation is directed toward program revision and improvement through continuous feedback, summative evaluation is more concerned with overall program effectiveness. The two designs (formative and summative) are not mutually exclusive, and in fact, formative information that is gathered throughout the course of a program or school year can easily become the main body of content for a summative evaluation report. The instruments described earlier were used at intermediary stages of the RDIM research, but the data was "stockpiled" so that it could be further reviewed and analyzed at the end of the pilot year. Used in this fashion, trends or patterns emerged that were not readily apparent when the data were examined at intermediate times throughout the year. For example, in reviewing a year-long collection of the Resource Room Teacher's Monthly Reports, an increase was seen in the number of Action Information Messages received as a result of increased Type I and Type II activities and the scheduling of "browsing time" in the resource room for Talent Pool students.

Parent, Student and Teacher Questionnaires

Because individual responses of the groups varied from district to district, this section provides a summary of the 12 individual evaluation reports which were prepared and disseminated to each respective district. For purposes of clarity, the individual percentages of each district's responses are not listed in this section. Instead, summary statements are used to present the general findings that reflect the collective responses across districts. The individual district report containing exact number and percentages of responses are on file at the University of Connecticut and are available in these separate reports. Although responses varied, several clear commonalities of opinion were evident from the collective responses of the field test districts.

Parent Evaluation of RDIM

Parent responses provided a wealth of practical suggestions, comments and feedback. In almost every district, over sixty percent of the parents of Talent Pool students responded to the questionnaire; in several districts, the response rate was over seventy-five percent. The majority of responding parents indicated that they were very familiar with the RDIM program and its procedures and practices.

Parents who indicated that they had attended the orientation meeting at which the RDIM was explained reported that they understood the model, the terminology, the procedures and that they had been given sufficient opportunity to visit the resource room and/or make an individual appointment with the teacher of the gifted or other school personnel. Parents who had not attended the orientation meeting but who had received information about the program also reported that they understood it, but were not as clear on procedures as were parents who had attended the meeting.

Most parents knew if their children had become involved in advanced level enrichment and had accordingly "revolved into" these types of activities (Type III Enrichment, Renzulli's Enrichment Triad Model). Generally, parents also indicated that they were familiar with the project or topic that their children had worked on while they had been "revolved into" the resource room to work on an advanced level enrichment experience. The area parents believed they were least familiar with was the area of curriculum compacting. In some districts, as many as half of the parents were not sure that they understood this procedure which streamlines the regular curriculum and allows students not to miss regular classwork when they are in the resource room by a system of strength analysis and pretesting.

When asked if their children had encountered any problems as a result of leaving the regular classroom to participate in the gifted program or if their children had encountered any problems with their friends because of their participation, parents usually agreed that this had not occurred. This was true in most of the districts. Any problems seemed to be the result of an isolated case in one school or one classroom in a district.

However, when asked if their children had expressed concerns about missing work in their regular classroom because they were involved in the gifted program, some of the field test districts did have a small percentage of parents respond affirmatively to this question. In the majority of those districts, the gifted program was a relatively new one (two-three years) and curriculum compacting or streamlining was not as widely used as was the case in districts with more mature programs.

Parents from all of the districts also overwhelmingly indicated that their childrens' general attitudes about participating in the special program was either enthusiastic or positive. Parents were able to select one of four responses on a Likert-type scale which ranged from enthusiastic and positive to indifferent or negative. In the great majority of the districts, not one responding parent said that their

child was indifferent or negative toward the program.

A similar question asked parents to determine if their children had expressed pleasure or enjoyment about the work he/she did in the program. Parents could select one of four responses which ranged from often or sometimes to seldom or never. In almost every district, parents unanimously agreed that their children enjoyed the work often or sometimes. Once again, in the majority of the districts, not one parent indicated that their child seldom or never expressed pleasure or enjoyment about the work he or she did in the program.

Another similar question asked parents to analyze their childrens' attitudes toward the degree of work in the gifted program. Parents could select responses which ranged from "very challenging" to "somewhat challenging" to "not at all challenging" or "couldn't tell". Once again, in almost every district, parents unanimously agreed that their children found the work in the gifted program to be either very challenging or somewhat challenging. Many parents indicated that they had observed positive changes in their child's behavior or attitude toward school as a result of t heir participation in the program. The following are representative comments from parents:

> She has always liked school. The TAG program, I believe, was a positive influence on her because of the depth at which she began to look at life and today's world has broadened.
>
> Our son enjoys having a special project to research to think about and work on. This type of program added the dimension he needed to feel that school is interesting and challenging. To have a place in school also.
>
> She talks more freely about school, seems to enjoy it more and likes to discuss it with family and friends.
>
> It gives him something to look forward to whereas in the past, he was less enthusiastic about school. He has been able to use some of the information learned in the program in other areas at school.
>
> More self-assured, positive attitude toward school, pleasure in exploring new topics.
>
> It is the only part of school he is excited about. Before he began the program, he was beginning to dislike school because it was boring.

Other positive benefits that children had realized through their participation in the program were summarized in this way by parents in several districts:

> When my child is working on a project, he finds it very challenging and talks about it a lot.

He enjoys doing his own creative thing in his own way. He enjoys the new challenges he meets and his mind is always overworking!

Both my children look forward to school, especially on days when they are involved in TAG. TAG helps hold their interest in school and in their other studies as well.

Anxious to participate. My child stayed with a project for a long period of time. She is not as bored and looks forward to the time she spends in the resource room.

My child has a much more positive attitude toward school; she is constantly searching for new topics of interest to her.

In general, parents who responded to the questionnaire indicated that their children looked forward to school more, had a more positive attitude about themselves, were more ambitious and more motivated to continue projects even after they revolved out of the resource room, and became more efficient in completing their regular classwork through their participation in the program.

In every district, parents overwhelmingly indicated that if their child expressed an interest in participating in the resource room again next year, they would encourage him/her to do so. In the great majority of the districts, 100% of the parents said they would encourage such participation. No negative comments were included in this section: instead parents usually praised the program when they explained why they would encourage their child to participate again. Several representative comments from many of the districts are included that reflect those attitudes:

Yes. I believe that a child should have every opportunity for stimulation available to him or her.

Yes. My son is very enthusiastic about the fact that he can choose his own work, the time he can spend on it, and he thinks it is very quiet without interruptions.

Yes. This was the highlight of my son's year in school. This aspect of school motivated him the most.

I think it is a great way for my child to express herself in the field she is interested in and she feels very proud that she is able to participate in this program. She looks forward to her time in TAG and can hardly wait to work on her project.

Yes. I think it gives any student a chance to explore and examine new subjects which are not a part of their everyday classroom work.

Yes. I think the stimulation and challenge provided by the Revolving Door resource room is not only viable but necessary for my child.

Yes. Because we as parents feel that it was very beneficial for our daughter and she enjoyed it.

When asked for comments on the adaptation of the traditional gifted program to the RDIM model, parents were extremely positive. And most important, there seemed to be no noticeable difference in the opinions of parents whose children had been in the traditional program when compared to parents whose children were identified under RDIM. Several representative comments from parents whose children were in the traditional program in the previous school year are included below:

Our daughter totally enjoyed TAG this year. As it stands now, it seems to me to be a better approach with the ability of the child to revolve out when the child completes a project. My child did not revolve out but interest and drive remained with her for the entire year.

The stimulation has been good for my child. I think the revolving door approach is excellent because it affords more children to be involved thereby creating a greater interaction among all the TAG students.

We are pleased to see the revolving door working. Our greatest concern is, of course, for the continued funding of the TAG program. Hopefully, the contribution to society will be recognized in time and every aspect will evolve through financial and moral support. Thank you for all your time and consideration given to Jenny. You're special too!

The Revolving Door seems to be working well with my son -- it does not disrupt his regular school work and seems to enrich his knowledge of a variety of subjects. Wish the approach had been used a year earlier. Contrast between last year and this year is just short of incredible.

As was indicated before, whether or not their children had participated in the gifted program in previous years, parents' reactions to the RDIM were favorable. Some parents, whose children were not in the program previously, wrote long thank you letters and expressed their appreciation and gratitude for the program in many ways. Representative comments from several of the field test districts are included below:

The program as far as we've been involved, seems just excellent. If it weren't for revolving door, my child might never have been exposed to this exceptional learning program -- my child is not a genius but a bright child who has the ability to learn and because of this exposure has developed good capabilities to study better and realize that anything is possible.

An indispensable program.

As a result of the talent pool our child was able to participate in the gifted program, thereby receiving a very worthwhile and enjoyable experience which she would not have normally been exposed to. We strongly endorse the Revolving Door approach.

We are very pleased with the Revolving Door approach since it gives more children an opportunity to become involved in the gifted program.

When asked to give any general comments or concerns the parents might have had about the TAG Revolving Door program and any suggestions or changes in the operation of the program for the future, parents responded in very many ways. A representative sample of parents responses from several districts are included below:

My child wasn't in your TAG program previously, but she is now because of the Revolving Door and I think it's great because it gives more children a chance to explore and discover many other fields that they are interested in.

I think the Revolving Door approach is good because it allows more children to participate in the TAG Program.

TAG is great and so is the Revolving Door approach. Luckily God created our child with a creative mind because he is shy and sometimes a loner - he loves to explore and create and he gets this in the TAG program. I hope he can continue next year. He also loves the TAG teacher.

I think that the TAG program helps to nourish (in my case) my child's gift of intellect beyond her classroom year. I think it is wonderful that there is a teacher to encourage my child's willingness to learn when I, as her mother, cannot be there to explain her eagerness. I hope this program continues.

I have been happy with the TAG program because without the new identification system, my daughter would not have been able to participate. Her scores on tests are by no means great. Because she has been "turned on" by geneology, her whole attitude towards school and her boring subjects has changed.

We feel that the TAG program and the Revolving Door program are great for all the children. We are glad our daughter could be part of this program. We are very pleased and hope it continues for many years."

I have nothing but praise for the efforts that you have made this year and the expansion of the program to the Revolving Door. It certainly suits more needs than the previous program. I think that allowing children to "rest" when the need arises is just great. We all need a rest at times and what better way is there than being able to step back, look at what you've done and think ahead. We are all for the concept of a Revolving Door.

Perhaps some of the most interesting parent opinions about the RDIM were expressed by parents who had children who had participated in other types of gifted programs that did not use the Enrichment Triad Model or the RDIM. A representative comment from a parent in that category is included below:

Our child participated in a different type of T.A.G. (one group chosen to work together) program in another school system for three years. She enjoyed it and thought herself very deserving of being chosen to participate. However, sometimes she felt strong pressure (generally self-imposed) to perform and occasionally felt negative about the burden of being chosen. I think the nicest part of the Revolving Door program is the lack of exclusivity, but yet the good feeling of being especially invited to participate in activities in which someone thought she would be interested. She also liked the idea of having a choice (once invited) whether she wanted to attend. We especially liked the program because it offers opportunities to strengthen creative thinking and problem solving rather than book learning.

In only isolated cases in three districts did parents raise questions about the implementation of the RDIM in their individual district. These comments were usually made by parents of children who were in the traditional program.

Often had the feeling that the Revolving Door had a large number of children to be served by one person and almost too much of a challenge or rather a responsibility.

The new form of the T.A.G. program seems diluted. The time spent is too little. The attention given to students is also reduced. Type I activities are very interesting but they should be aimed at all children and should be a regular part of school, not an adjunct to T.A.G. Type II and III activities are more directly related to the program. Students should have their classes compacted in the subjects in which they excel so that they can pursue Type III activities in depth. More flexibility in the system should allow greater exploration on the student's part. It is our hope that the program will begin earlier in the year so that students have the opportunity to participate fully and complete a project which they can share with classmates.

It is interesting to note that the suggestions offered in the second parent comment reflect the goals and practices of a properly operated Revolving Door Program. In the model, Type I Activities (Enrichment Triad Model) are supposed to be offered to all children. In the way the model should be implemented, Type II (Enrichment Triad Model) activities are made available to children on a weekly basis and curriculum compacting is completed so that students may participate in Type III (Enrichment Triad Model) investigations. One of the reasons the RDIM was designed was to simplify the identification system and allow the program to begin earlier. Therefore, it may be safe to conclude that if the model had been implemented as it was designed, this comment may not have been applicable.

Student Evaluation of RDIM

Students responding to a questionnaire were also overwhelmingly positive about the program. The response rate was extremely high as most resource room teachers encouraged students to complete the form while in school. Almost every student in the participating districts who had completed a Type III investigation made positive comments about his/her product. Many students indicated how hard they had worked on their investigation and how much they had learned. Representative comments from several districts reflect students' responses when asked if they enjoyed their work and were satisfied with the final product:

> I didn't think I could accomplish what I did. My teacher really helped me to believe in myself.
>
> I found out many things about the Solar System that I wouldn't have learned in my classroom. I also felt good that I could share my work with other students.
>
> I really enjoyed school work - for a change.
>
> I never felt like I was doing work although I've never worked harder on anything than I did on my project.
>
> My parents are proud of what I've done and that makes me feel good.
>
> I'm really satisfied - I worked hard.
>
> I became interested in things I didn't even know existed.

Most students who responded to the questionnaire agreed that they had enjoyed working on their projects and were very satisfied with the results of their work. When asked to name some of the things they had learned while working on their projects, students generally listed the specific area of the study they had been pursuing. The majority also said they had learned how to work with others, how to become more independent and responsible, how to complete tasks and manage time, and how to become more creative. Many of the students spoke in general terms about their feelings upon the completion of their product.

Students usually indicated that they were proud, eager, that it had been hard work, that they felt great about their project, that they enjoyed working on something they were interested in.

Most students who responded to the questionnaire said that they were more comfortable about managing their own time after working on an independent or group project and they also believed that they had developed better skills for working with other students as a result of time spent in the resource room. A large percentage of the students from every field test district believed that they had developed better skills in using resource materials as a result of the time spent in the resource room. Almost every student who responded from each district said that they enjoyed their relationship with their special program teacher and an overwhelming percentage of students said that they were looking forward to returning to the resource room to work on another project. Most students understood why they were revolving out.

Most of the students believed that"revolving in"to complete an advanced level study had helped them to develop their special interests. Most students also believed that it was fair to give more children a chance to"revolve in"even though they might have to "revolve out". Many students said that they felt said to be nearing the completion of their projects but most agreed that they had worked hard and were glad to be finishing. Children responding to an open-ended question which asked them to describe their feelings about their work agreed almost unanimously that they had enjoyed the work and were satisfied with the results.

When asked to circle adjectives that describe their feelings about RDIM, students across districts circled the following most frequently: fair, a good idea, friendly, creative, satisfied, good relations with others and cares about me. Almost every student who responded to the questionnaire thought it was fair to give other children a chance to engage in an advanced level study even though it meant they would have to revolve out.

A representative selection of student responses to the following ending question are listed below: What are your thoughts as you near completion of your project and approach revolving out?

> The thoughts of mine as I neared my project and approached revolving out was thinking of another project.
>
> I was excited and happy about everything that we did.
>
> I thought I accomplished a great deal.
>
> I had very good thoughts running through my head and I really don't mind "revolving out". It is a very good program!
>
> I am very pleased with my project.
>
> I am glad my project turned out the way it did. Thank

God! It was a hard task making the telescope and I was very excited with the outcome.

I am glad to be done, even though it was fun, It was a lot of work.

I am very proud of the work I have done.

Good but sad, because I wanted to go on.

I don't really feel sad or happy either. I just hope that I can do it next year.

As I was finishing my project, I got a little frustrated but as I got more organized, I felt as if I had done something for myself.

I feel like I was a new person and I feel proud of myself and others.

My project took a lot of time and effort and I am glad I am revolving out, but I really enjoyed my project because it was very challenging.

I am looking forward to another project.

I had so much fun I wanted to stay in but I want to give others a chance too!

Classroom Teacher Evaluation of RDIM

Most of the classroom teachers who responded to the questionnaire said that they were familiar enough with the RDIM to be able to explain it to parents. Most of the responding teachers said that they were familiar enough with the procedures for referring a student to the resource room to be able to explain them to parents. However, many teachers who responded to the questionnaire said they were not totally familiar with the procedures for revolving a student out of an advanced level investigation or with the process of curriculum compacting.

Almost all of the classroom teachers who responded to the questionnaire said that they were confident about the recommendations they had made for revolving students into the resource room for advanced level study. The majority of the responding classroom teachers said that they believed the gifted program was not at all "watered down" because it now provided services to students who may not necessarily score in the top five percent of achievement or IQ tests.

When asked if the RDIM caused disruption in their usual instructional routine, most teachers indicated that it caused little or no disruption. Comments from several districts reinforced this belief:

I feel the program ran very smoothly this year. Much consideration was given to scheduling the times

for programming and browsing.

It was occasionally annoying to have children pulled out of academics in an unscheduled time to go to the TAG room because it was the only time a specialist was available for them. However, this was a minimal number of times.

Children leaving class worked more smoothly this year because all seemed to leave during the same basic time.

Most of the responding teachers across the field test districts were extremely positive and enthusiastic about the RDIM resource room teacher. In only two isolated cases were negative or indifferent comments made about the RDIM resource teacher and in both of those cases, the staff member making them, had applied for, but had not received, the resource room position. Classroom teachers usually indicated that they interacted with the resource room teachers frequently and that they were very or usually available for: creativity training, curriculum compacting and individual consultations. Classroom teachers across the districts indicated that some parents had expressed questions about why their children were not in the program and how their children were able to get involved in advanced level Type III experiences. Other questions from parents reported by classroom teachers revolved around how much emphasis was placed on scores, how children were selected, the types of services that were available, and the length of time the child was serviced. However, classroom teachers seemed able to deal with the questions and indicated that most of the questions from parents were very positive.

When asked to comment on changes of the attitudes of Talent Pool students who were not in the TAG program last year and Talent Pool students who were in the TAG program last year, most teachers indicated that they had noticed positive changes. Several classroom teachers in a few of the districts noticed that Talent Pool students who had been in the program last year felt less superior and teachers believed that this was positive as it tended to eliminate the "elitism" that many programs for the gifted face. They also indicated that Talent Pool students who were not in the program last year were proud that they were now involved. Classroom teachers also believed that non-Talent Pool students were curious about the program and some were motivated to do more in school to be able to participate. In general, classroom teachers also said that they felt more actively involved in the childrens' Type III products because they had initiated the "light bulbs". Teachers also indicated that they observed student interaction about Type III products with students who were not in the Talent Pool.

Classroom teachers also noted a significant change in student attitudes as a result of being in the "Talent Pool" versus being "identified gifted." They believed they had observed past feelings of superiority diminish greatly and reported that students worked more cooperatively with one another. This positive attitude was partly due to the large number of Type I and Type II Enrichment activities planned throughout the year. Several schools formed enrichment teams which

included classroom teachers, administrators, resource teachers and student representatives. These teams were responsible for scheduling enrichment experiences (speakers, films, lectures, etc.) for Talent Pool students as well as for all students at given grade levels or within given schools.

The attitudinal changes that teachers generally noticed about Talent Pool students were usually positive. Many teachers indicated that Talent Pool students were usually positive. Many teachers indicated that Talent Pool students are very enthusiastic about their participation in the program. Teachers also said that Talent Pool students were enthusiastic and remain good students in the classroom. Many classroom teachers also noted some changes in the classroom environment that seemed to be the result of using the RDIM. One teacher said:

> Talent Pool students often bring their added information to the class and share their enthusiasm.

Few of the classroom teachers observed any attitudinal or adjustment problems when Talent Pool students revolved out of the Resource Room.

Teachers indicated that they sometimes found non-Talent Pool students emulating behaviors of Talent Pool students who had revolved into the resource room to complete projects. One teacher said that many of her students wanted to make their own puppets after a member of their first grade class revolved in to write a book on how puppets began and how to make your own puppet. Other teachers commended the students involved in producing student newspapers and recommended that monthly newsletters be prepared by TAG resource teachers for the purpose of sharing enrichment ideas and information about TAG activities.

When asked to comment on any changes in their classroom environment which seemed to be the result of using the Revolving Door Identification Model, many classroom teachers across the districts said they had noticed a change in their classroom. Almost all changes that were noted were positive including: more creativity, more search for interest areas on the parts of students, more sharing of knowledge, more creative things happening, and excitement on the parts of students who were involved. Teachers also indicated that improved attitude on the part of parents because they felt that the school was now recognizing their child's ability. Other teachers indicated that students who are attending activities in the resource room and engaging in Type III investigations carried their work over into the classroom and continued to work on projects.

A small percentage of the responding teachers said they noticed some attitudinal and/or adjustment problems when talent pool students were revolved out of the resource room and Type III activities. These teachers said that certain students seemed disappointed but, at the same time, these students developed a real drive to search for new interests, so that they could revolve back into an advanced level activity. A small percentage of classroom teachers also indicated that sometimes students who had revolved into an advanced level Type III investigation

did not complete all of the assignments that were required in the regular classroom.

Almost every responding classroom teacher indicated that if they had to choose between the traditional gifted program and the Revolving Door Model, they would prefer the Revolving Door Model. Teachers indicated they particularly liked the program emphasis on responsibility and self-discipline. These representative comments help summarize the attitudes of classroom teachers:

> The program this year, through its wider scope, has met the needs of many children who have not been reached in the past. I am very enthusiastic about the program.

> I think the Revolving Door Program is great -- the idea of covering a larger group of talented students is great!

When asked to choose adjectives which describe their feelings about the RDIM TAG Program, classroom teachers from across the districts circled the following adjectives most frequently: good idea, fair, active, satisfied, sensitive, contented, clear, concerned, and orderly. When classroom teachers were asked to provide a few comments about their overall concerns and feelings about the RDIM, responses were generally positive. Many teachers wrote long and detailed explanations about their opinions like the ones below.

> For me, Revolving Door has been a nice alternative to a system that was too organized and rigid for me (our traditional model). Often, I nominated students in good faith for our program only to find out they did not have appropriate scores on their Stanford to get accepted into the program. I then took on the "why bother to nominate" attitude. Revolving Door has certainly given me an uplift because I hear you saying "I care about your judgements regarding the student." I, too, believe that my judgement regarding abilities, task commitment and the like are more realistic than test scores. I have had seven students revolve in during the year and I have been extremely pleased with their progress. Their change in attitude has been terrific also. They now seem to feel that their ideas count and isn't that what teaching is all about?

> Whether or not you've tried, you've helped me to evaluate my own teaching styles and understand that I, too, need to be more responsive to students in their individualities and interests. For that - I thank you! It has certainly changed my ideas about teaching and given me a new outlook.

Other teachers across all of the districts replied in shorter but equally eloquent ways.

> Excellent program -- feel proud to have it in my school.

Bravo! Students in the program had a very positive learning experience.

I have smiled so many times because students have "blossomed" right before my very eyes.

I have been happy with the model.

A better method of identification!

I've enjoyed the many Type I's.

Students seem more comfortable with the resource room this year.

I am pleased with the program. I personally like the idea that I can choose which children will participate. All of the enrichment experiences offered were worthwhile and exciting.

Super! I was a teacher have a more active role in selecting the children for the program.

This summary of the student, parent and teacher questionnaires is intended to illustrate how the evaluation instruments were used to analyze various aspects of the program and the types of modifications that were implemented as a result of the information that was gathered. Used in this way, the questionnaires highlight their value as part of a formative evaluation design. The material presented which summarized the questionnaire results was included in end-of-year evaluation reports which were prepared as a part of this study and sent to the field test districts. Thus, we see how the questionnaire results can be used in both formative and summative fashions.

The Principal's Incident Report

An important source of information about the operation of RDIM was obtained by keeping a record of critical incidents related to the program experienced by field test principals. Although a record of such incidents should be maintained by resource and classroom teachers, the principal was considered to be a key person in the recording of these data because he or she was often the person contacted when various types of problems occur. Contacts with the principal were usually made by parents, classroom teachers, resource teachers and occasionally by students in the program. By recording critical incidents over a long period of time, certain trends, patterns or recurring types of problems were documented.

The principal in each building using RDIM was provided with copies of the Principal's Incident Reports. Individual problems were usually dealt with at the time of their occurrence and all reports were reviewed on a regular basis in order to determine if general modifications in the program appeared to be warranted. In most recorded cases, parents contacted the principal with questions about why their children were or

were not selected for the program. Other issues that generally surfaced from comments recorded on the Report included: scheduling, curriculum compacting, community awareness about the program, newspaper reporters who raised questions about the program and enrichment for all students. Every principal who actively kept the Principal's Incident Report was able to effectively resolve any issues that were raised. In a large percentage of instances, principals indicated that they were thankful that their school was using the RDIM because it was a fairer and much more defensible programming and identification model than had been previously used by their district. In many instances, a large number of positive incidents were recorded in the report including: interaction with parents, students and teachers involved with the program, exciting and stimulating enrichment activities that were sometimes planned as a part of the RDIM Program for the entire school, and encouraging instances where conservative or slightly rigid classroom teachers began to compact curriculum.

Resource Room Teacher's Monthly Report

The Monthly Report was developed to monitor various practices that were deemed necessary for the successful implementation of the RDIM. The report was designed in such a way that it required only a few minutes of the resource teacher's time to complete, but it yielded certain types of information that were very useful for evaluation purposes. Through the regular completion of the Monthly Reports, a continuous and readily available record was maintained to assess whether those specific practices necessary for implementation were achieved. The reports were carefully analyzed to determine if certain enrichment experiences were being planned and if an adequate number of students were "revolving in" to complete advanced level investigations. Used in this way, the Monthly Report was an excellent device for formative evaluation because it gives educators relatively specific direction for making in-process changes in our program. The reports were summarized at the end of the year and included in (summative) evaluation reports along with any programmatic changes that resulted from their formative use throughout the year.

Other items on the Monthly Report were used for similar formative and summative evaluation purposes. If, for example, the reports showed a decrease in Action Information Messages, procedures for increasing the flow of referrals were implemented. The reports provided ready made data for end-of-year charts that showed monthly figures relating to students who have revolved into and out of the Type III dimension of the program. These reports were also used to provide a quick overview for visitors or external evaluators who may visit the program periodically throughout the year. Finally, and perhaps most importantly, the Monthly Reports helped to give direction to the program, and in a certain sense, encouraged persons involved in the program to carry out the objectives of RDIM.

The Monthly Report Forms completed in the field test districts included a brief description of the enrichment activities planned by either the RDIM resource teacher or the Enrichment Team in the school. It also included space in which resource teachers could voice or express any concerns relevant to the implementation of the model. By doing

that, concerns could be dealt with during the year.

Throughout the field test years of the RDIM, resource teachers' comments on the Monthly Report Forms and their discussions during site visits and other regular meetings were recorded. Their attitudes about the model reflect both the strengths that they found inherent in the model and their concerns about implementation. Their reactions are generally focused around several themes which emerged throughout the field testing of the model.

When the resource teachers discuss the strengths of the model, one important belief emerges. All of the field test teachers of the gifted have at one time or another praised the model because it allowed them to work with students who would not have been identified in the traditional gifted program. In their words at the completion of a full year of field testing RDIM:

> RDIM allows me to work with children who were not given the chance to do exceptional work in our traditional program -- they simply did not make the 5% cutoff.
>
> Because of the Revolving Door Identification Model, I have been able to work with many students on a flexible schedule. Students may be revolved in without enormous amounts of paperwork, lengthy meetings, and/or disturbance of classroom procedures. Also, because of this model, I have found that those students who are ready to revolve out will do so, allowing others to revolve into the program. Lastly, a benefit that has not been mentioned by others is the fact that students from various grades and/or classrooms are able to meet for a period of time in their school day. Students who, perhaps, would not have become acquainted, have developed friendships. I have seen numerous positive relationships develop among my students.
>
> I especially like being involved with a larger number of students and staff. I see possibilities for students who would not otherwise be picked up by traditional means.
>
> The RDIM allows a much larger percentage of students to complete a Type III investigation. 78% of the students who have finished or are presently working on a Type III investigation would never have been programmed under the existing state guidelines.

Another strength that the resource teachers found in the model was that RDIM enables certain students (above average) to be served at certain times (when above average ability, task commitment, and creativity are brought to bear upon a particular area) and under certain circumstances (in a resource room with a resource teacher). This belief was echoed by many of the resource teachers from the various field test districts.

> The model allows children to exhibit exceptional behavior when approaching for them. The amount of "giftedness" during

the course of the year varies according to the individual's abilities and needs.

RDIM has advantages over a traditional program. In the traditional approach, once a student is identified as "gifted", he is expected to perform in that manner. Unfortunately, even gifted children are not always highly motivated to pursue a study. Given these conditions, the teacher of the gifted finds himself pushing some students through the program. Through RDIM, a student revolving in has already established a commitment. In a traditional program, the problem of a borderline gifted student is difficult to solve. This is the student, highly motivated in one area, but not "across the board" gifted, who may be left out of the traditional program. In the Revolving Door Model, his need can be satisfied. The RDIM approach permits more of these children to be challenged. In concept, RDIM is a better approach to solving the needs of children than a traditional model.

RDIM allows the students to "turn off". Students cannot be productively gifted all the time. RDIM, by revolving students in and out allows for this and fosters a healthier attitude in gifted students.

Another strength of the RDIM that was repeatedly mentioned by resource teachers is the enrichment activities that are routinely offered to students who are not involved in the gifted program. Resource teachers frequently discussed how Type I enrichment activities (general exploratory in nature) were frequently extended to other students.

The RDIM allows a much larger percentage of students to participate in enrichment Type I and Type II activities. Frequently, all of our school's students have been able to attend Type I activities.

Type I Enrichment Committees have been helpful in scheduling outstanding events for the elementary schools. Some Type I activities are offered to all students, some are open to all interested students and some are scheduled for Talent Pool students, and then opened up for other students if openings exist.

Other resource teachers indicated that they believed that the RDIM had become a part of their school and had been a positive addition to the general educational climate in the school. A primary concern of educators of the gifted must be to provide for above average ability students not only in the specified hours that they spend in a resource room or an advanced class or in a mentor relationship, but also for the rest of their time in school. These non-program hours usually represent the majority of a student's time in school. If more classroom teachers, administrators and instructional faculty can become actively involved in the gifted program through shared ownership in the program, students

involved in the program will benefit in many positive ways. The concept of program ownership had been discussed with the field test districts in the training provided prior to implementation and the effects were mentioned by many resource teachers.

> Principals are actively engaging in presenting and organizing Type I events in many of the schools.

> I am more convinced now that I have administered this program for this year that Revolving Door is a valuable and viable program for gifted children. The involvement of the whole school in many of the projects as well as interest generated by many of our Type I and II activities that has overflowed into the regular classroom has been a positive force in the success of our model program. The idea perhaps that RDIM does not operate in isolation but can be an interesting and exciting part of a whole school's atmosphere should be stressed.

> Classroom teachers have become more actively involved in the program; several are actively working (either Type I, II, III) with Talent Pool students.

> Although scheduling is more difficult with RDIM, more children benefit from the active involvement of their classroom teacher in helping to identify an interest and then following through on the interest in a Type III investigation. Curriculum compacting has been an on-going process in our district. Although all of our classroom teachers have received extensive in-service training in curriculum compacting, a small percentage still had not accomplished this objective as well until this year, when their involvement in the program was greater.

> I find more parents interested in the education of their child being willing to work for the program and the school.

It is interesting to note that some resource room teachers realized at the completion of the first year of field testing the model that they had not stressed the concept of ownership early enough in the school year. One teacher reflected on that in this way:

> The Revolving Door Identification Model relies heavily on positive relations between teachers in the classroom and the TAG teacher. Because of the flexible scheduling and dependence on communication, it is essential that ownership of the program be dealt with at an early point in the school year.

The concern of the resource room teachers that ownership strategies had not been planned early enough in the school year was discussed by only two resource room teachers. Two other concerns were mentioned much more frequently. The first and most overwhelming concern dealt with scheduling and time. It should be noted that the preoccupation with

problems in scheduling was extremely evident in the beginning of the field test year. However, as the year progressed, scheduling concerns diminished as both resource room teachers and classroom teachers became more accustomed to the RDIM. Once familiarity was attained, acceptance followed. By the end of the field test year, resource room teachers of the gifted had generally adjusted to the changes in scheduling that the RDIM necessitates. Once that occurred, resource room teachers of the gifted had to face still another realization. That realization centered around their changing role. In many ways, resource room teachers in RDIM programs are truly resources and facilitators. It was difficult for some of the teachers to relinquish control of all of the responsibility for independent and small group investigations. That understanding often coupled with the problem of scheduling and resulted in program adaptation suggestions like the following:

> One additional concern is that of "time." The positive aspects of flexibility in scheduling can also be frustrating since the TAG teacher may want to schedule in numerous students -- leaving little time for Type I and especially Type II. Perhaps Type II should be a facet of the program that is dealt with to a large degree -- by classroom teachers in the regular classroom.

Once resource room teachers adapted to the model, two or three who were not organized as many of the others, indicated that they needed to find a system which streamlined the paperwork involved in any gifted program.

> My concern uppermost in my mind is the logistics of handling easily such a large number of students and not having yet established a system on doing it in an uncomplicated and time-consuming manner.

> Planning and organizing Type I's, sending out permission slips, notices, phone calls, and paperwork in general, is very time consuming. Most of the paperwork is necessary, but much of it could be accomplished by someone other than the resource room person who could then spend more time with students.

Half of the RDIM field test districts provided services to talent pool students in grades one through three. As noted in an earlier section of this chapter, a significantly smaller proportion of 1-3 grade Talent Pool students revolved in to complete advanced level products than did 4-6 grade Talent Pool students. This was mentioned as a concern by one of the resource room teachers involved with this age level.

> A concern of the K-3 age level is the ability for a child to self-initiate an independent study. At this level, children are being exposed daily to new ideas and concepts. Very few children lock onto one idea that interests them enough to pursue it in great depth. At this age, perhaps, more attention

> should be focused on small group investigations guided by the resource room facilitator, based on areas of general interest exhibited by students. A greater understanding of a subject area might then lead to an individual Type III investigation.

The same teacher also discussed his frustration over a high IQ kindergarten student and the services he received:

> An IQ of 142, socially at Kindergarten level; learning basic number manipulations but understanding math concepts beyond his years. This gifted child needs curriculum reorganization. He cannot revolve in for a better math and reading program. His needs should really be met on a daily basis, a difficult situation when most gifted program teachers share their time between schools.

Although the implications of both of those concerns will be discussed in Chapter V, other resource room teachers working with students at that age level did not indicate a concern or solved their concerns in various ways. The example below is indicative of this:

> RDIM is working at our school, but the model has been adapted to the student population. We have found some students can initiate and pursue a Type III project independently, while some students have difficulty and need more structure. We have successfully used group projects which meet on a weekly basis. Usually, group projects are introduced by a Type I experience and students elect to participate in pursuing the area in more depth (Type III).

Once again the changing role of the resource room teacher of the gifted emerged. If certain situations emerged (i.e., fewer number of 1-3 grade Talent Pool students revolving in to complete a product), resource room teachers were called upon to adapt or modify the procedures. One resource room teacher seemed to summarize the process perfectly by saying:

> RDIM requires the teacher to be a facilitator. Crucial to the model's success is the facilitator's ability to understand the needs of your Talent Pool students and adapt the model to the students and teachers that are involved in the program's implementation.

In summary, when interviewed at the conclusion of the school year, none of the resource room teachers of the gifted who had participated in the field testing of the RDIM said that they would prefer to revert back to the use of the traditional identification and programming model. A few of the teachers felt so strongly about the benefits of the RDIM that they said they would resign or request a transfer into a classroom if their administration decided not to continue using the RDIM. At the conclusion of the year, all but one of the field test districts continued using the model. Several of the districts expanded their programs to additional grade levels and eight new additional districts were accepted and will participate in future research of the RDIM. Many

of the statements that the resource room teachers made at the conclusion of the year can be summarized in this representative comment from one teacher:

> RDIM has removed much of the elitist stigma from our program. Our students work hard in their Type III investigations and although non-Talent Pool students can nominate themselves to participate in the program, few do, because of the work involved. Many students benefit from the Type I activities and our resource room teachers see all Talent Pool students on a weekly basis for Type II training. Our teachers and parents seem delighted with our program.

Summary

In summary, the procedures used to determine the proportion of students who revolved in to complete an advanced level investigation showed that a significantly higher proportion of females revolved in than males. Additionally, it was found that a significantly higher proportion of 4-6 grade students revolved in than 1-3 grade students. Analysis of variance procedures showed no significant difference in the quality of products completed by students in the two groups and no significant difference in the overall quality of products completed by males and females. However, a significant interaction between sex and group with respect to the quality of products existed for the total of all of the Key Concepts on the Student Product Assessment Form as well as for the five individual Key Concepts. Follow-up t-tests revealed no significant difference between males and females in either group on the Total of the Key Concepts on the Student Product Assessment Form.

A qualitative analysis on the effects of implementing the RDIM on students, teachers, parents and administrators showed that the model was highly successful across districts. Individual adaptations were made by districts so that the model could be used most effectively. Evaluations by students, classroom teachers, administrators, parents and resource room teachers were highly favorable.

Discussion and Implications

The purpose of this study was to analyze a new identification and programming model, the Revolving Door Identification Model (RDIM) which was substituted for a more traditional identification and programming model in 11 school districts in Connecticut in the 1980-1981 school year.

Despite a large amount of accumulated research suggesting that creatively productive gifted persons come from a broad range of intellectual aptitudes and abilities (MacKinnon, 1965; Munday and Davis, 1974; Holland, Astin, 1962; Renzulli, 1977), educational programs which are established to meet the needs of the academically gifted usually exclude all but the top 1%-5% of a school population. Students are usually selected for inclusion in gifted programs on the basis of a pre-determined IQ or achievement test cut-off. The use of such limiting criteria for student selection results in the exclusion of many above average but not necessarily superior ability students (Renzulli, 1977) who, if given the opportunity, produce the same quality or a superior quality of work than their traditionally identified peers.

> ...if we restrict our efforts...to students who have been preselected on the basis of test scores for special programs, we may fail to 'turn on' the child who has the greatest potential for benefiting from interest development and creativity producing activities (Renzulli, 1980, p. 4)

Discussion Relating to Research Question One

Research Question One asked:

> To what extent and in what manner does the age and sex of talent pool students affect the frequency in the process of "revolving in" to the resource room to engage in advanced level investigations?

As indicated earlier, through the use of the outlined statistical procedures, it was found that both age and sex did indeed affect the frequency in the process of "revolving in" to complete advanced level investigations. A higher proportion of females "revolved in" across grade levels than did males. This is especially significant in light of accumulated research which indicates lower production rates for gifted females,a fear of success in gifted women, and the lack of studies which focus on achievement motivation in gifted females when compared to gifted males (Callahan, 1979; Horner, 1972). Based on this research, it appears that a significantly higher proportion of gifted girls in grades 1-6 revolved in than did their male counterparts. Thus, it would seem

that much of the suppositions about environmental and hereditary factors which affect females' desire to achieve do not apply to the 1-6 grade female Talent Pool students who were a part of this study.

Further, this study determined that a significantly lower proportion of 1-3 grade students revolved in to complete an advanced level study than did 4-6 grade students. The implications of programs for the gifted which service primary grade students have only recently begun to be discussed. Identification at a very early age has been an on-going problem; what to do with the identified students has only just recently been addressed. In terms of the finding of this study, it is apparent that a smaller percentage of students in grades 1-3 "revolved in". Therefore, further questions must be asked including:

1) Were students in grades 1-3 who did not revolve in, aware that they had the opportunity (i.e., did they understand the model)?

2) Were regular (weekly) training sessions (for Type II enrichment activities) held for primary aged students in the resource room?

3) Were some group investigations of student interests arranged to demonstrate the skills that are necessary for subsequent bona fide Type III investigations to emerge? These group investigations might be called scaled down Type III investigations and might be in areas such as: computers, archeology, creative writing, where group products may emerge.

Based on the observations of the field test districts and the findings of this research study, a plan for modifying RDIM for the primary grades was included in the book, The Revolving Door Identification Model (Renzulli, Reis, Smith, 1981).

Discussion Relating to Research Question Two

Research Question Two asked:

> Is there a significant difference in the quality of products completed by male and female students in a gifted program who would have been identified according to the traditional guidelines (the top 1-5%) as selected by high scores on an achievement or IQ test) and those male and female students eligible for inclusion under the guidelines of the Revolving Door Identification Model?

As was indicated earlier, through the use of analysis of variance procedures no significant difference was found in the quality of products completed by the two groups of students. Thus, as assessed by resource room teachers of the gifted using the Student Product Assessment Form, which has been demonstrated to be both a valid and reliable instrument

in this study, the quality of products completed by students in the two groups was indistinguishable. In fact, as can be seen in Table 3, the mean score of the Student Product Assessment Form was slightly higher for students who would not have been traditionally identified.

Further, no significant differences were found in the quality of products completed by males and females as can be seen in Table 4. The research implications of this question are far reaching. If no significant difference exists in the quality of work between females and males in the Talent Pool, when do the differences begin to emerge? When do males begin to exhibit more signs of creative productivity and females less evidence of this mode of expression as evidenced in the review of the literature. This research study finds females producing an equally high calibre of work (see Table 4).

In examining the interaction between sex and group with respect to the quality of products (see Table 5), several significant interactions were found. The highest quality product ratings were found for females in the traditionally identified group and for males in the group identified under the expanded guidelines of the RDIM. Although these interactions were significant, follow-up t-tests comparing males and females within the traditionally identified and the group identified under the expanded guidelines of RDIM indicated no significant difference existed.

The findings about the quality of products came as no surprise to the resource room teachers or classroom teachers who took part in the RDIM research over the two years of the field testing. For years, classroom teachers have been insisting that there are children who sit in their classrooms and never have a chance to participate in the gifted program who are capable of producing a higher quality product than students who are traditionally identified. It was this intrinsic belief that led Renzulli to propose the idea behind the RDIM in an article entitled: "Will the Gifted Child Movement be Alive and Well in 1990?" (1980). This research indicates that while traditional programs are not necessarily servicing the wrong students, they are not providing services for a larger percentage of above average students who are capable of producing an equally high level of excellent work if they are given the opportunity. The students in group B of this research study who were identified under the expanded guidelines of the RDIM, and who completed products which were rated slightly higher (see Table 3) than the products of those students in Group Q, would not have been given an opportunity to participate in most gifted programs in this country.

It must be noted that in some instances, students who revolved in from the group identified under RDIM (group B) had an extremely high level of enthusiasm for completing a product and this was their first opportunity to do so. Many students in the traditionally identified group (group A) participated in a gifted program before. This was not true, however, in every district. Two of the field test districts were starting new gifted programs by using the RDIM.

Because there was no difference found in the quality of products completed by males and females in the resource room, certain questions must be addressed. When do qualitative differences begin to emerge

between sexes? If both sexes are given equal opportunities in a resource room, will the differences in female achievement as discussed in the review of the literature be negated? Other questions which center around personality variables and adolescence may also be considered in a subsequent research study which focuses on achievement in grades 7-12.

Discussion Relating to Research Question Three

Research Question Three asked:

> In what manner and to what extent does the implementation of the Revolving Door Identification Model affect the attitudes of students, teachers, and administrators who interact with the gifted program as measured by Student, Teacher, and Parent Questionnaires, Teacher Monthly Report Forms, Principal Incident Report Forms and Interviews.

The effects of implementing the RDIM upon those who were involved in it in the field test districts were as varied and as complex as were the individuals who successfully accomplished the task. Just as each person is a complex and multi-faceted individual, each RDIM program that emerged from the training days and the interaction with the research team at the University of Connecticut proved to be an individual program. Of course, many similarities existed in the overall program organization and structure from district to district; however, each district and resource room teacher brought distinct traits and highly individualistic touches to their implementation of the model. This is the way the model was meant to be implemented. Those who try to replicate a program that they have observed without taking into consideration their individual district differences, strengths, problems, personalities, scheduling procedures and even the idiosyncracies relevant to their program, will fail in their efforts. Every gifted program must be carefully planned with an individual district in mind. For example, what is highly effective in one district that has the benefit of administrative support for the gifted program may be a failure in a district where that support is lacking.

What did emerge from the close interaction with the field test districts were certain key traits that tended to make some programs more effective than others. None of the traits or key features relate to variables that cannot be changed like the personality of an individual administrator or teacher of the gifted. Instead, all of the key features that will be identified in this discussion are procedures that may be accomplished in any gifted program; they simply necessitate careful planning in advance and the time needed to complete them. The key features that did emerge were: inservice planning prior to program orientation; ownership in the program; providing identified students with a thorough orientation; communication between program personnel and classroom teachers, parents, administrators and the community; and flexibility of the program personnel and the classroom teachers.

Implications

When viewed as effective evidence to use to produce change, educational research can have far-reaching effects. As an agent to produce change, educational research must be of practical significance to those who conduct it and to those who will use it. With this in mind, the findings of this study have keynoted several important points:

1. That a significantly higher proportion of girls in grades 1-6 "revolved in" to complete advanced level investigations in a resource room for the gifted than did boys.

2. That a significantly higher proportion of 4-6 grade students "revolved in" to complete advanced level investigations in a resource room for the gifted than did 1-3 grade students.

3. That no significant difference exists in the quality of products completed by students who were traditionally identified when compared to the quality of products completed by students identified under the expanded guidelines of the RDIM.

4. That no significant difference exists in the quality of products completed by males and females in grades 1-6 who "revolved in" to the resource room.

5. That a significant interaction exists between sex and group with respect to the quality of products completed. The highest quality product ratings were found for females in the traditionally identified group and for males identified under the expanded guidelines for RDIM. It should be noted, however, that the follow-up comparisons between males and females within each respective group were not significant.

6. That the Revolving Door Identification Model is a highly effective model for both identification and programming which is easily implemented in many different districts.

Recommendations for Further Research

Findings from this present investigation raise a number of possibilities for further study, some of which are already underway:

1. A study could be undertaken to examine the proportion of males/females who "revolve in" and subsequently complete products at the junior high and senior high age level.

2. A qualitative analysis of students' products could be done to compare students who would have been tradition-

ally identified with students in various groupings of ability rather than just the entire cluster of students not traditionally identified, but those identified under the RDIM. For example, traditionally identified student products might be compared with the products of students who score in the 85%-90%, and the 80%-84%, and perhaps the 75%-79% in some districts.

3. A further study should examine the difference in the quality of products completed by male and female students in grades 7-8 and 9-12 in gifted programs. The results of that study could be contrasted with the results of this study and then compared with the review of the literature which shows lower productivity for gifted females (Schwartz, 1980; Callahan, 1979).

4. A further study that analyzed the personality differences between students who "revolve in" and those who do not, and between students who complete products and those who "drop out" could be completed. A pre-post comparison of children who "revolve in" and those who do not might yield data which could clarify the significance of self-concept and achievement motivation as a pre-requisite to creative production.

5. An examination of the quality of products completed by students who are in the top 5% (group A) as compared to the next 15-20% (group B) in districts that had no previous gifted program could be compared to districts in which the gifted program had changed from a traditional format to the RDIM. In this way, it might be determined that the variable of group may be more important than the variable of previous gifted program experience.

6. An additional field testing of the RDIM should be undertaken with the use of the book on the model (Renzulli, Reis and Smith, 1981) as the primary training tool instead of the personalized training that occurred with the field test districts. In this way, replicability will be assessed without the necessity of personal interaction which would greatly limit the number of districts which could implement the model.

7. Additional field testing of the RDIM at the junior high and senior high levels should be undertaken. Field test experiences with the model at this age level were conducted in only three districts. Results were too limited to be able to be included in this research.

8. Additional field testing of the RDIM should be conducted in districts where full-time resource room teachers are not available. It should be determined how much auxillary assistance for carefully in-serviced classroom teachers is necessary before a successful RDIM program can result.

REFERENCES

Anderson, J. V. Psychological determinants. In R. B. Kundsin (ED.), Women and success: The anatomy of achievement. New York: William Morrow & Co., 1974, 200-207.

Barron, F. Creative person and the creative process. New York: Holt, Rinehart, and Winston, 1969.

Blaubergs, M. Personality studies of gifted females: An overview and commentary. Giftd Child Quarterly, 1978, 22. 539-547.

Birnbaum, J. A. Life patterns and self-esteem in gifted family-oriented and career-committed women. In M. T. S. Mednick, S. S. Tangri, & L. W. Hoffman (Eds.), Women and achievement. New York: John Wiley, 1975, 396-419.

Bloom, B. A. (Ed.). Taxonomy of educational objectives, handbook I: The cognitive domain. New York: David McKay Co., 1956.

Bogdan, R. and Taylor, S. Introduction to Qualitative Research Methods. New York: John Wiley and Sons, 1975.

Callahan, C. The gifted and talented woman. In A. H. Passow (Ed.), The gifted and the talented: Their education and development, 78th Yearbook of the National Society for the Study of Education. Part I, 1979, 401-423.

Clark, B. Growing up gifted. Columbus, OH: Charles E. Merrill, 1979.

Cox, C. M. The early mental traits of three hundred geniuses. Volume II: Genetic studies of genius. Stanford, CA: Stanford University Press, 1926.

Do you have to be gifted to teach the gifted? Instructor, 1977, May, 20.

Durr, W. K., and Collier, C. C. Recent research on the gifted. Education, 1960, 81, 163-169.

Ebel, R. L. Estimation of the reliability of ratings. Psychometrika, 1951, 16, 407-424.

Ernest, J. Mathematics and sex. American Mathematical Monthly, 1976, 83, 595-614.

Fox, L. H. Sex differences: Implications for program planning for the academically gifted. Paper presented at the Lewis M. Terman Memorial Symposium on Intellectual Talent, Baltimore, MD, November 1975, p. 3.

Gallagher, J. J. Teaching the gifted child (2nd ed.), Boston: Allyn and Bacon, 1975.

Galton, F. Hereditary Genius, London: Macmillan, 1869.

Gallagher, J. J., & Weiss, P. The education of gifted and talented students. Washington, DC: Council for Basic Education, 1979.

Getzels, J. W., & Csikszentmihalyi, M. From problem solving to problem finding. In I. A. Taylor, & J. W. Getzels, (Eds.)., Perspective in creativity. Chicago: Aldine, 1975, 90-116.

Getzels, J. W., and Dillon, J. T. The Nature of giftedness and the education of the gifted. In R. M. W. Travers, (Ed.), Second Handbook of Research on Teaching, Chicago: Rand McNally and Co., 1973.

Getzels, J. W., & Jackson, P. W. The meaning of "giftedness" -- an examination of an expanding concept. Phi Delta Kappan, November 1958, 40, 275-277.

Goertzel, V., & Goertzel, M. G. Cradles of eminence. Boston: Little, Brown, 1962.

Goertzel, M. G., Goertzel, V., & Goertzel, T. G. 300 eminent personalities. San Francisco: Jossey-Bass, 1978.

Graham, P. A. Expansion and exclusion: A history of women in American higher education. Signs, 1978, 3, 759-773.

Groth, N. J. Success and creativity in male and female professors. Gifted Child Quarterly, 1975, 19, 328-335.

Guilford, J. P. The nature of human intelligence. New York: McGraw-Hill, 1967.

Guilford, J. P. Psychometric methods. New York: McGraw Hill Book Company, Inc., 1954.

Helson, R. Generality of sex differences in creative style, Journal of Personality, 1968, 36, 33-48.

Helson, R. & Crutchfield, R. S., Mathematicians: The creative research and the average Ph.D. Journal of Consulting and Clinical Psychology, 1970, 34, 250-57.

Helson, R. Women Mathematicians and the Creative Personality. Journal of Consulting and Clinical Psychology, 1971, 36, 210-20.

Hinkle, D. E., Wiersma, W. E., Jurs, S. G. Applied statistics for the behavioral sciences, Chicago, IL: Rand McNally College Publishing Company, 1979.

Hoffman, L. W. The professional woman as mother. In R. B. Kundsin (ed.), Women and success: The anatomy of achievement. New York: William Morrow & Co., 1974, 222-228.

Hoffman, L. W. Fear of success in 1965 and 1974: A follow-up study. Journal of Consulting and Clinical Psychology, 1977, 45, 310-321.

Holland, J. A. and Austin, A. W. The prediction of the academic, artistic, scientific and social achievement of undergraduates of superior scholastic aptitude. Journal of Educational Psychology, 1962, 53, 132-143.

Hollingworth, L. S. Children above 180 IQ. H. L. Hollingworth, (Ed.), New York: World Book Co., 1942.

Horner, M. S. The motive to avoid success and changing aspirations of college women. in J. M. Bardwick (Ed.), Readings on the Psychology of Women. New York: Harper & Row, 1972.

Hoyt, D. P., The relationship between college grades and adult achievement: a review of the literature. Iowa City: American College Testing Program Research Report No. 7, 1965.

Hoyt, D. P. The relationship between college grades and adult achievement: A review of the literature. Research Report No. 7, 1965. Iowa City, Iowa: American College Testing Program, 1965.

Jones, J. L. Women in American science. USA Today, 1978, 197, 4.

Kaslow, F. W., & Schwartz, L. L. The attractive successful female professional: Self-perceptions. Intellect, 1978, 108, 313-315.

Kundsin, R. B. To autonomous women: an introduction. In R. B. Kundsin (Ed.), Women and success: The anatomy of achievement. New York: William Morrow & Co., 1974, 9-12.

Lally, A., & LaBrant, L. Experiences with children talented in the arts. In P. Witty, (Ed.), The gifted child, NYC: D. C. Heath, 1951, 243-256.

Laycock, F. Gifted Children. Glenview, IL: Scott Foresman and Co., 1979.

Maccoby E. and Jacklin C. Womens intellect, in Potential of Women, (Ed.) Farber, S. M. and Wilson, R. H. L., New York: McGraw-Hill Book Company, 1963, 24-39.

Maccoby E., and Jacklin, C. The psychology of sex differences, Stanford: CA: Stanford University Press, 1974.

MacKinnon, D. W. The creativity of architects. In C. W. Taylor (Ed.), Widening horizons in creativity. New York: John Wiley & Sons, 1964.

MacKinnon, D. W. Personality and the realization of creative potential. American Psychologist, 1965, 20, 273-281.

Maeroff, G. I. After 15 years, a harlem experiment is re-appraised,

New York Times, August 19, 1981, pp. 15; 17.

Male, R. A. and Perrone, P. Identifying talent and giftedness, Roeper Review, 1980, 2 (3), 9-11.

Marland, S. P. Education of the gifted and talented: Report to the Congress of the United States by the U.S. Commissioner of Education and Background papers submitted to the U.S. Office of Education. Washington, DC: U.S. Government Printing Office, 1972.

Marston, A. R., It's time to reconsider the graduate record examination. American Psychologist, 1971, 26, 653-655.

McClelland, D. C. Testing for competence rather than for intelligence. American Psychologist, 1973, 28, 1-14.

McCurdy, H. G. The childhood pattern of genius. Horizon, 1960, 2, 33-38.

Mead, M. Sex and achievement. Forum, 1935, 94, 302.

Mednick, M. T. Research creativity in psychology graduate students. Journal of Consulting Psychology, 1963, 27, 265-266.

Miles, C. C. The early traits of three hundred geniuses, Volume II. Stanford, CA: Stanford University Press, 1926.

Milstein, B., & Bodin, J. We, the American women: a documentary history. New Jersey: Jerome S. Ozer, 1977.

Munday, L. A. & Davis, J. C. Varieties of accomplishment after college: perspectives on the meaning of academic talent. Iowa City: American College Testing Program Research Report No. 62, 1974.

Nadelson, T., & Eisenberg, L. On being married to a professional woman. American Journal of Psychiatry, 1977, 134, 1071-76.

Nicholls, J. C. Creativity in the person who will never produce anything original and useful: The concept of creativity as a normally distributed trait. American Psychologist, 1972, 27, 717-727.

Norfleet, M. Personality characteristics of achieving and underachieving high ability senior women, Personnel and Guidance Journal, 1968, 46, 976-980.

Passow, A. H. (Ed.) The gifted and the talented. Chicago: Chicago University Press, 1979.

Passow, A. H. The nature of giftedness and talent. Gifted Child Quarterly, 1981, 25, 5-10.

Patton, M. Q. The Qualitative Evaluation Methods. Beverly Hills: Sage Publications, 1980.

Pegnato, C. W. & Birch, J. W. Locating gifted children in junior high schools: Comparison of methods. In W. B. Barbe & J. S. Renzulli (Eds.), Psychology and education of the gifted: Selected readings New York: Irvington Press, 1975.

Portland Public Schools. The gifted child in Portland. Portland, OR: Portland Public Schools, 1959.

Pritchard, M. C. The contribution of Leta S. Hollingworth to the study of gifted children. In P. Witty, (Ed.), The gifted child. NYC: D. C. Heath, 1951, 47-85.

Renzulli, J. S. A guidebook for evaluating programs for the gifted and talented. Ventura, CA: Ventura County Superintendent of Schools. 1975.

Renzulli, J. S. The enrichment triad model: A guide for developing defensible programs for the gifted and talented. Mansfield Center, CT: Creative Learning Press, 1977.

Renzulli, J. S. What makes giftedness?: reexamining a definition. Phi Delta Kappan, 1978, 60, 180-184, 261.

Renzulli, J. S. What we don't know about programming for the gifted and talented. Phi Delta Kappan, May 1980, 61, 601-602.

Renzulli, J. S. Will the gifted child movement be alive and well in 1990? Gifted Child Quarterly, 1980. 24. (1), 3-9.

Renzulli, J. S., Reis, S. M., and Smith, L. H. The revolving door identification model, Mansfield Center, CT: Creative Learning Press, 1981.

Renzulli, J. S., Smith, L. H., and Reis, S. M. Identifying and programming the gifted. Education Digest, 1981, 47, (7), 45-47.

Renzulli, J. S., & Smith, L. H. A guidebook for developing individualized educational programs (IEP) for the gifted and talented. Mansfield Center, CT: Creative Learning Press, 1979.

Renzulli, J. S., & Smith, L. H. Two approaches to identification of gifted students. Exceptional Children, 1977, 44, 512-518.

Richards, J. M., Jr., Holland, J. L. & Lutz, S. W. Prediction of student accomplishment in college. Journal of Educational Psychology, 1967, 58, 348-355.

Roach, R. M. "Honey, won't you please stay home." Personnel and Guidance Journal, 1976, 55, 86-89.

Rodenstein, J., Pfleger, L. R., & Colangelo, N. Career development of gifted women, Gifted Child Quarterly, 1977, 21, 340-358.

Roe, A. The making of a scientist. New York: Dodd Mead, 1952.

Schwartz, L. L. Advocacy for the neglected gifted: females. Gifted Child Quarterly, 1980, 24, 113-117.

Schwartz, L. L. Can we stimulate creativity in women? Journal of Creative Behavior. 1977, 11, 264-267.

Schwartz, L. L. Women and their achievement motivation. Pennsylvania Personnel and Guidance Association Journal, 1975 (Spring), 11-16.

Schwartz, L. L. Women: Re-entry and challenge. Journal of Sociology and Social Welfare, 1977, 4, 845-849.

Shakeshaft, C., & Palmieri, P. A divine discontent: Perspectives on gifted women. Gifted Child Quarterly, 1978, 22, 468-477.

Shapiro, J. P. "Fear of success" imagery as a reaction to sex-role inappropriate behavior. Journal of Personality Assessment, 1979, 43, 33-38.

Staines, G., Tavris, C., & Jayaratne, C. The Queen Bee syndrome. Psychology Today, 1974, 7 (8), 55-60.

Stanley, J. and Benbow, C. The devil's advocate: sex differences in mathematical reasoning ability. (An interview conducted by J. Alvino), Journal for Education of the Gifted, Spring, 1981, 3, pp. 169-176, 239-243.

Stanley, J. C., Keating, D. P., & Fox, L. H. (Eds.). Mathematical talent: Discovery, description, and development. Baltimore: Johns Hopkins University Press, 1974.

Suter, B., & Domino, G. Masculinity-femininity in creative college women.
Journal of Personality Assessment, 1975, 39, 414-420.

TAG Evaluation Committee, Sample instruments for the evaluation of programs for the gifted and talented. Storrs, CT: Bureau of Educational Research, 1979.

Taylor, I. A. A retrospective view of creativity investigation. In I. A. Taylor & J. W. Getzels (Eds.), Perspectives in creativity Chicago, Aldine, 1975, 1-36.

Terman, L. M. Genetic studies of genius: the gifted group at midlife. Stanford, CA: Stanford University Press, 1959.

Terman, L. M. Genetic studies of genius: mental and physical traits of a thousand gifted children. Stanford, CA: Stanford University Press, 1926.

Terman, L. M. and Oden, M. H. Genetic studies of genius: the gifted child grows up. (Volume III). Stanford, CA: Stanford University Press, 1947.

Terman, L. M & Oden, M. H. The Stanford studies of the gifted. In P. Witty (Ed.), The gifted child. NYC: D.C. Heath, 1951, 20-46.

Treffinger, Donald J. Guidelines for encouraging independence and self-direction. Journal of Creative Behavior, 1978, 12, (1), 14-20.

Torrance, E. P. Prediction of adult creative achievement among high school seniors. Gifted Child Quarterly, 1969, 13, 223-229.

Tuttle, F. Evaluation report for Concord. Project Gather and Project Lift, Spring, 1980.

Tuttle, F. B., Jr., & Becker, L. A. Characteristics and identification of gifted and talented students. Washington, DC: National Educational Association, 1980.

Wallach, M. A. Tests tell us little about talent. American Scientist, 1976, 64, 57.

Warner, D. J. Women astronomers. Natural History, 1979, 88 (5), 12-26.

Ward, V. S. Educating the gifted: An axiomatic approach. Columbus, OH: Charles E. Merrill, Inc., 1965.

Weiler, D. The alpha children: California's brave new world for the gifted. Phi Delta Kappan, 1978, 60, 185-187.

Weitzman, L. J., & Rizzo, D. Images of males and females in elementary school textbooks in five subject areas. Biased Textbooks. Washington: National Foundation for the Improvement of Education, 1974.

Weiner, B. Theories of motivation from mechanism to cognition. Chicago, IL: Rand McNally Publishing Company, 1972.

Whipple, G. M. (Ed.). The education of gifted children. 23rd Yearbook, Part I. National Society for the Study of Education. Chicago: University of Chicago Press, 1924.

Whitmore, J. R. Giftedness, conflict and underachievement. Boston: Allyn and Bacon, 1980.

Witty, Paul A. Who are the gifted? In N. B. Henry (Ed.) 57th Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago Press, 1958.

Women in new history texts: Stereotypes, distortions, and omissions. Bulletin on the Council on Interracial Books for Children (CIBC), 1976, 7 (7), 4-7.

Zinberg, D. College: When the future becomes the present. In R. B. Kundsin (Ed.), Women and success: The anatomy of achievement. New York: William Morrow & Co., 1974, 129-137.

THE REVOLVING DOOR IDENTIFICATION AND PROGRAMMING MODEL:

CORRELATES OF CREATIVE PRODUCTION

James R. Delisle, Ph.D.
The University of Connecticut

Joseph S. Renzulli, Ed.D.
The University of Connecticut

Introduction

As defined by various state laws and historical traditions, "the gifted" are a distinct set of individuals set apart from others by reason of their extraordinary learning abilities. It should follow, then, that through either limited or exhaustive scrutiny, school districts interested in identifying "the gifted" should have little trouble doing so. Pennsylvania, for example, has chosen an IQ score of 130 as signifying giftedness, whereas California's demarcation between being gifted and otherwise is an IQ of 140 or above. (One might assume that Nebraska -- midpoint, moving westward, between the above two states -- would classify giftedness as IQ 135; however, such is not the case.)

But, bolstered by research of gifted individuals, statistical imprecision of IQ tests, and the common sense knowledge of parents and teachers, lawsuits have recently arisen which cause lawmakers and educators alike to question the validity of any criterion as being the sole basis upon which to define giftedness. ("Across the Nation", November 1980). In response to these criticisms, additional identification tools such as teacher, parent, and peer nomination scales have been developed. Any, indeed, such subjective techniques and devices have found favor with many whom have heretofore been critics.

However, the underlying assumption that a reservoir of gifted children exists somewhere in the general population remains the same despite the number and variety of identification instruments used. The believe that all gifted children will surface on the bases of multiple criteria is widespread, yet one need only consider the analogy of a beachcomber to see its flaws. For as surely as a sophisticated metal detector will locate metallic debris with greater accuracy than a magnet on a stick, both will, in their turn, bypass some shards of tin or copper. Likewise, despite the greatest variety of objective and nominative measures, some children who have high abilities will elude detection.

A review of research by Renzulli (1978) suggests that the determination of a priori giftedness based upon these preordained minimum standards may overlook bright children who can benefit from supplemental educational services. Through the analysis of research and case studies by MacKinnon (1965), Roe (1952), and Barron (1969), Renzulli has ascertained that giftedness is recognized in expressed behaviors (i.e., the publication of a book; the investion of a tool) rather than in underlying academic or personality traits (i.e., IQ or achievement test scores). Also, gifted behaviors within an individual are both temporal and specific to certain areas of study (e.g., medicine, poetry, architecture), and not pervasive of time and situation. Lastly, gifted behaviors are exhibited by a relatively large proportion of the general population at certain times, in certain situations, and under certain circumstances.

Gifted behavior may also be effected by particular non-intellective characteristics. The examination of locus of control (LOC), "the belief that reinforcements are contingent upon one's own behaviors, capacities, or attributes (Internal LOC) or that reinforcements...are under the control of powerful others, luck, chance, or fate (External LOC) (Joe, 1971, p. 619), is suggested by research that indicates a positive correlation between the acceptance of responsibility for one's successes and failures (Internal LOC) and verbal fluency (Penk, 1969), high IQ (McGhee and Crandall, 1968), and high achievement via test scores (Crandall, Katkovsky, and Crandall, 1965). In addition, several personality factors have been shown to be significantly more present among Internals, including "intellectual efficiency" and "achievement conformance" as measured by the California Personality Inventory (Hersch and Scheebe, 1967).

Studies which specifically related LOC with identified gifted students are few, and result in mixed findings. (Zaffran (1976) found the labels of "internal" and "external" to be imprecise, unstable, and essentially meaningless as his subjects demonstrated a different LOC in different situations. Aaron (1979) found no significant differences in LOC within academic settings between gifted children receiving special services and those not in special programs. Pal (1979), in emphasizing the importance of recognizing LOC as a strong intervening variable between a child's intellectual potential and actual performance, suggests that LOC in academic settings may be an important but overlooked factor in students' achievements. Stewart (1979) adds to Pal's findings by stating that externally controlled gifted students have different styles of learning than do gifted students with a high internal LOC, implying that LOC may, indeed, affect one's reception to and capacity for high academic achievement.

Likewise, the examination of academic self-concept in relation to the production of gifted behaviors deserves further study. The largest body of research in which self-concept is examined as a possible correlate with academic achievement of the gifted is in studies done with underachieving adolescents. Miller (1962) found that underachieving gifted students were more negative towards self than were achieving gifted students. Similar results were found by Combs (1964) and Mehta (1968).

Durr and Collier (1960) in a survey of low-achieving and high achieving gifted students in grades 4, 5, and 6, found that the low achieving group evidenced definite trends toward a less favorable personality pattern, as defined by the California Personality Inventory including a lack of self-reliance and a lessened sense of personal worth.

Finally, Yates (1975) adds more evidence to the correlation between high achievement and a positive self-concept in his findings of significant differences in self-concept between achieving and non-achieving gifted students. He cautions, though, that differentiating achievement from non-achievement is, at best, arbitrary, and may minimize the external validity of his own or others' work.

The Revolving Door Identification and Programming Model

The Revolving Door Identification and Programming Model (RDIM; Renzulli, Smith and Reis, 1981) represents a significant new approach to selecting students for participation in gifted programs. Based on a conception of giftedness as a clustering of above average abilities, creativity, and task commitment brought to bear upon specific topic areas (Renzulli, 1978), RDIM focuses on the belief that a relatively large proportion of persons manifests gifted behaviors at certain times, in certain areas of study, and under certain circumstances. Consequently, RDIM allows for the identification of children with above average (but not necessarily superior) abilities for the purpose of providing resource room services at some point in the school year, depending upon expressed student need for enrichment opportunities.

In contrast with traditional methods of programming for the gifted, RDIM assumes that giftedness is both topical and temporal in nature, and is exhibited in behaviors rather than existing as a set of personality and intellectual traits. For example, a child who completes the design and construction of a model future city, and presents his/her plans to a local architectural firm for professional evaluation, is exhibiting gifted behavior and creativity in the "real world" sense of the words. Such behavior is manifest in relation to a particular topic of interest at some point in time in the child's life. Through RDIM, the student is recognized for the degree to which his/her abilities were brought to bear upon a specific topic area (e.g., architecture) rather than for the mere attainment of a particular test score.

In essence, RDIM provides the mechanism for students to come into and out of a resource room as the need arises. It is an approach designed to increase substantially the number of students involved in special services, minimize concerns about elitism by doing away with the you-have-it or you-don't-have-it concept of giftedness, and most importantly, provide supplementary services at the time and in the performance areas where such services have the highest potential for doing the most good for a particular youngster.

Method

The population for this study consisted of groups of students identified as being in the top 25% of their school's academic ranks. Termed the Talent Pool, determination as to which children qualified as being eligible was made on one or more of the following factors:

1. Achievement test scores in reading or math of 75%ile or above, using local norms;

2. Group IQ scores at the 75%ile or above, using local norms;

3. Teacher recommendation in at least one of four areas; creativity, leadership, learning characteristics, and motivation.

Children identified in this top 25% were further classified by class rank into two groups:

a. Traditional group: children in the 95+%ile of the student population (local norms). These pupils would ordinarily receive gifted program services.

b. Expanded group: children ranking between the 75%-95%ile of the student population (local norms). These pupils are not ordinarily eligible for gifted program services.

Students represented grades 1-8 from ten school districts in Connecticut. For purposes of data analysis, all Talent Pool students were subdivided across grade level (Grades 1-3: n=378; grades 4-6: N=614; grades 7-8: N=129; Total N=1,121).

Test instruments

The instrument used to measure students' generalized expectancies for internal versus external control in academic settings was the Intellectual Achievement Responsibility Questionnaire (IAR). The IAR provided a measure for assessing children's beliefs that they, rather than other people, luck, fate, or some other external force were responsible for their academic successes and failures. The instrument measured responsibility for classroom successes (I+) and classroom failures (I-). Subscale scores have generally shown low correlations, providing evidence of the independence of the I+ and I- measures. Test-retest reliability coefficients (two-month interval) were moderately high for both I+ (.66) and I- (.74).

In order to examine self-concept, three forms of the Self-Appraisal Inventory (SAI) were used in this study. The primary, intermediate, and secondary levels of the SAI were used with pupils in grades 1-3, 4-6, and 7-8, respectively. SAI's are self-report instruments which measure self-concepts of children in the areas of peer relations, family relations, school relations, and general self-concept. For this study, only the subscale of school relations was used.

The internal consistency indices for each subscale of the SAI used in this study range from .62 for the Primary version to .81 for the Intermediate version. Test-retest reliability coefficients (two-week interval) range from .53 (Primary) to .78 (Intermediate) in the SAI's original field studies.

Procedures

In order to determine whether the dependent measures of 1) entering or "revolving in" to a resource room and 2) product completion within the resource room were influenced by the independent variables of academic ability as measured by class rank (traditional vs. expanded group), self-concept as a learner and LOC, separate simple discriminant function analyses (DFA) were employed for pupils in the grade level clusters of 1-3, 4-6, and 7-8. The purpose of each DFA was to attempt to predict group membership (i.e., revolving in/not revolving in to a

resource room; completion/non-completion of a product in the resource room) according to class rank, self-perceived levels of confidence as a learner (academic self-concept), and LOC in academic settings. Since it was not assumed that any one of the independent variables would be a more powerful discriminator than each of the other factors, the independent variables were entered into each respective DFA in the order of most to least discriminating value.

Since the LOC scale used in this study provided measures of students' degree of responsibility for their academic successes and failures, correlated t-tests were completed to check for significant differences between mean scores for internalization of success and failure for pupils in grades 4-6 and in grades 7-8.

Results

The results of the stepwise DFAs revealed several of the independent variables as significantly effective predictors for revolving in to the resource room. Table 1 contains the independent variables that contributed significantly to differentiating between students who revolved in to the resource room and those who did not. The standardized coefficients listed under "Function 1" in Table 1 represent the relative contribution of each variable to the discriminant function. Accordingly the most discriminating variable as regards group membership was class rank (higher class rank involving a greater degree of revolving in). For pupils in either grades 1-3 or 4-6, academic self-concept was the second most powerful indicator (high academic self-concept reflecting a student's revolving in). For fourth through sixth graders, I- discriminated between the two groups (those who internalized failure were not likely to revolve in); likewise, I+ was an adequate discriminator between students who revolved in and those who did not (high internalization of academic successes aligned with revolving in to the resource room). For students in grades 7-8, class rank was the sole significant predictor among the four independent variables.

Table 2 contains the number of students in grades 1-3 properly classified ("hits") into the group who revolved in or did not revolve in based upon the discriminant function using the independent variables which proved to be significant predictors (i.e., class rank and academic self-concept).

Tables 3 and 4, respectively, contain the numbers of students correctly classified into the group who revolved in or did not revolve in for grade levels 4-6 and 7-8.

The stepwise DFA conducted in an effort to predict which students in grades 4-6 completed projects in the resource room showed academic self-concept to be the only significant predictor ($F=3.989$, $df=1/1$, p .05). Since all cases in this function were predicted to have completed projects, no increases in percentage beyond chance assignment was determined through this analysis (see Table 5).

When discriminant function analyses were attempted for product completion in the resource room for students in grades 1-3 and 7-8, the

occurrence of only one non-empty group per analysis precluded such investigation. This situation happened because all projects attempted by children who revolved in in these grade levels were completed. Table 6 presents the standardized discriminant function coefficients and subsequent F ratios for the variable of academic self-concept among fourth through sixth graders, as well as stating the number of students in grades 1-3 and 7-8 who completed projects.

The correlated t-tests on the LOC subscales of I+ and I- determined significant differences between the internalization of academic successes and failures for students in grade ranges 4-6 and 7-8. As seen in Tables 7 and 8, the results of these t-test analyses proved highly significant ($p < .001$) in both instances.

Discussion

An inspection of the statistically significant predictor variables for the DFA of revolving in seems to both bolster and contradict research conducted on creative producers. It appears, for example, that since class rank was an efficient predictor for revolving in to the resource room, those responsible for selecting pupils for gifted programs might consider only that one measure. However, examination of Table 9 illustrates the real-world effect such a procedure would have on above average children who do not meet the stringent "cut off" of 95+%ile on a standardized aptitude or achievement battery. In very practical terms, 236 children would have been excluded from participation in resource room activities who were provided the opportunity to participate through RDIM's expanded criteria. In fact, a full 56% of all children who revolved in to the resource room were ineligible for gifted program involvement under existing Connecticut statutes. Conversely, if the ten districts participating in this study had followed traditional approaches to the identification of the academically gifted, they would have identified 146 children who chose not to explore an individual interest via resource room involvement. While it may be argued that many of these 146 children would have benefited in ways other than as measured by the development of individual or small group projects,

> if we restrict our efforts...to students who have been preselected on the basis of test scores for a special program, we may fail to 'turn on' the child who has the greatest potential for benefiting from interest development and creativity producing activities. (Renzulli, 1980, p.4).

For those who would contend that product completion requires the utmost in measured academic ability, the tabulations in Table 10 dispel this assertion. There is no measurable difference in the product completion rate by students in the Traditional Group and those in the Expanded Group. In fact, the results of the DFA on fourth through sixth graders on the dependent measure of product completion provided evidence that the sole discriminating factor between completers and non-completers was academic self-concept--a variable that did not correlate

at any significant degree with class rank, as defined in this study.

In addition to class rank, children who revolved in and those who did not were able to be discriminated on the basis of academic self-concept (grades 1-6). Such a finding, coupled with the discriminating power of locus of control for fourth through sixth graders in relation to revolving in provides justification for the inclusion of subjective measures (e.g., teacher evaluation of students, as used in this study) in the identification of students for a gifted program. Indeed, given the inconsistencies and controversies surrounding the "chicken and egg" syndrome of determining which is antecedent, self-concept or academic strength (Bledsoe and Garrison, 1962), it is logical to make all attempts at heightening each outcome via encouragement of the other.

The results of the correlated t-tests between internalization of academic successes and failures, in which all pupils in grades 4-8 reported significantly higher scores for the I+ measure of responsibility for classroom successes, is in accordance with previous research (Whitmore, 1980). It may be noted here that academic failure as a foreign happenstance for the bright student has been suggested (Delisle, 1980; Mehorter, 1964). Thus, the ability to conceptualize reactions to academic failures may be irrelevant or, at best, hypothetical for some above average children.

The high degree of product completion among revolved in students (97%) supplies a potent rationale for using RDIM as an identification and programming model for the above average ability student; it solidifies the contention that if a pupil enters the resource room for a specific purpose, then the levels of involvement and interest will be maintained sufficiently so as to complete the specific project under investigation.

This "sense of purpose" for inclusion in a gifted program's resource room is often not seen in traditional designs in which students are identified as "gifted" in September, and receive supplementary services through June. Oftimes, students in these traditional programs lack both direction and knowledge of their roles as gifted students. RDIM, though, focuses in on each child's interest areas, in hopes to spur exploration of these interests at a greater depth and range. Concomitantly, when the child places herself in the role of creative producer (as evidenced by the majority of students who revolved in in this study), giftedness as behavior supersedes the notion of giftedness as a particular set of preordained intellective traits.

The results of this present research indicate clearly that RDIM was an effective endeavor--both statistically and in the practical realities of school operation--and that the true benefactors of this expanded identification and programming model were the children who monopolized on the chance to channel (and challenge) their talents.

Implications

When viewed in the light of its effectiveness on "real world" change, educational research can be transformed from cloudy theory into practical significance. In this regard, the findings of this study have enunciated several key points:

1. That a high rank in class, while being an effective predictor of resource room involvement, "misses" a substantial proportion of students who function effectively on an independent basis, despite their less-than-superior academic achievement.

2. That class rank, while discriminating between students who "revolve in" to a resource room, does not differentiate between pupils who complete attempted products and those who fail to complete products.

3. That academic self-concept appears to play an important role in a child's decision to pursue a topic of interest, and also, in the child's likelihood to complete attempted products.

4. That bright children tend to "take credit" for their academic successes while delegating to others, fate, or "bad luck" a substantial portion of their school failures.

The implications of these findings for school personnel involved with the placement of children into gifted programs -- administrators, resource room teachers, and counselors -- are varied and noteworthy. Coupled with the research of Hoyt (1965) and Terman (1959), this present research shows that any identification scheme using stringent IQ or achievement test scores to exclude children from receiving services in a gifted program's resource room lacks defensibility. Further, and pragmatically, such exclusionary practices disregard the common sensibilities of teachers and parents who have learned better than to believe in the omnipotence of the IQ.

Perhaps the most striking implication of this research is the credence it establishes for the importance of non-intellective factors which influence creative production by students. Self-concept, for one, is a characteristic which may override or circumvent the highest of standardized test scores for the child who is genuinely self-assured about his abilities to succeed. To ignore the effects of one's self-perceptions on productive accomplishments is tantamount to dissecting the child into "affect" and "academe" -- but surely, the two must mesh.

The significant differences between children's internalization of success and failure deserve notice by those who serve as guides or counselors. Questions remain as to why such extreme differences occurred, and will be best answered through further empirical and phenomenological research.

Lastly, the overall effects of RDIM are best measured child by child. Unlike traditional program designs for the gifted, RDIM allows each student to "act gifted" during particular times of maximum interest. Pervasive giftedness -- across all subject areas, at all times, in the classroom and on the schoolyard -- is replaced with competence in certain curricular or extracurricular areas. Certainly, this interpretation of giftedness as a topical and temporal set of behaviors is a view whose perspective is more aligned with the reality existing in our increasingly specialized world.

REFERENCES

Aaron, I.T. The effects of ECE, non-ECE, and rapid learner programs on the achievement, self-concept, and locus of control of selected third and fourth grade mentally gifted minors (Doctoral dissertation, University of Southern California, 1979). Dissertation Abstracts International, 1979, 39, 7127A. (No ordering information)

Across the Nation. The School Administrator, November, 1980, 37, (10), p.8.

Barron, F. Creative person and the creative process. New York: Holt, Rinehard, and Winston, 1969.

Bledsoe, J.C. and Garrison, K.G. The self-concepts of elementary school children in relation to their academic achievement, intelligence, interests, and manifest anxiety. Athens, GA: University of Georgia, 1962.

Combs, C.F. Perceptions of the self and scholastic achievement in the academically capable. Personnel and Guidance Journal, 1964, 43, 47-51.

Crandall, R.A., Katkovsky, W., and Crandall, V.J. Children's Beliefs in their own control of reinforcements in intellectual-academic achievement situations. Child Development, 1965, 33, 91-109.

Delisle, J.R. With apologies to Farragut. G/C/T, 1981, in press.

Durr, W.K. and Collier, C.C. Recent research on the gifted. Education, 1960, 81, 163-169.

Hersch, P.D. and Scheebe, K.E. On the reliability and validity of internal-external control as a personality dimension. Journal of Consulting Psychology, 1967, 31, 609-614.

Hoyt, D.P. The relationship between college grades and adult achievement: a review of the literature. Research Report No. 7 1965. Iowa City, IO: American College Testing Program, 1965.

Instructional Objectives Exchange. Measures of self-concept K-12. Los Angeles: The Instructional Objectives Exchange, 1972.

Joe, V.C. Review of internal-external control as a personality variable. Psychological Reports, 1971, 28, 619-640.

MacKinnon, D.W. Personality and the realization of creative potential. American Psychologist, 1965, 20, 273-281.

McGhee, P.E. and Crandall, V.C. Beliefs in internal-external control of reinforcement and academic performance. Child Development, 1968, 39, 91-102.

Mehorter, J.T. Self and society: an independent study course for gifted high school students. (Doctoral dissertation, University of Virginia, 1964). Dissertation Abstracts International, 1964, 25, 3879-A. (University Microfilms No. 64-10, 909).

Mehta, P.H. The self concept of the bright underachieving male high school student. Indian Education Review, 1968, 3, (2), 81-100.

Miller, M. Superior underachievers. School Sociology, 1962, 90, 134.

Pal, H.I. Child rearing practices and locus of control in gifted adolescents (Doctoral dissertation, University of Toronto, 1978). Dissertation Abstracts International, 1979, 39, 4184-A. (No ordering information).

Penk, W.E. Age changes and correlates of internal-external locus of control scales. Psychological Reports, 1969, 25, 856.

Renzulli, J.S. What makes giftedness?: Reexamining a definition. Phi Delta Kappan, 1978, 60, 180-184, 261.

Renzulli, J.S. Will the gifted child movement be alive and well in 1990? Gifted Child Quarterly, 1980, 24, (1), 3-9.

Renzulli, J.S., Smith, L.H., and Reis, S.M. Identifying and programming the gifted. Education Digest, 1981, 47, (7), 45-47.

Roe, A. The making of a scientist. New York: Dood and Mead, 1952.

Stewart, E.D. Learning styles among gifted and talented students: Preferences for instructional techniques. (Doctoral dissertation, University of Connecticut, 1979). Dissertation Abstracts International, 1979, 40, 2889. (University Microfilms No. 80-3, 762).

Terman, L.M. Genetic studies of genius: The gifted group at midlife. Stanford, CA: Stanford University Press, 1959.

Whitmore, J.R. Giftedness, Conflict, and Underachievement. Boston: Allyn and Bacon, 1980.

Yates, P.R. The relationship between self-concept and academic achievement among gifted elementary school students. Unpublished doctoral dissertation, University of Florida, 1975.

Zaffran, R.T. A case study approach to an understanding of factors affecting the development of locus of control in gifted and talented adolescents. (Doctoral dissertation, University of Wisconson-Madison, 1976). Dissertation Abstracts International, 1976, 37, 6288-A. (University Microfilms No. 76-29, 951).

TABLE 1

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS AND DISCRIMINANT FUNCTIONS ANALYSIS F RATIOS FOR THE VARIABLES THAT DIFFERENTIATED BETWEEN STUDENTS WHO REVOLVED IN AND THOSE WHO DID NOT

Grade Level Ranges	Variables	Function 1	Discriminant Analysis F
1-3 N=378	Class Rank	.91931	30.403**
	Academic Self-Concept	.42288	18.459**
4-6 N=614	Class Rank	.75928	42.155**
	Academic Self-Concept	.57306	36.936**
	Locus of Control-Internalizes Failure	-.26945	26.018**
	Locus of Control-Internalizes Success	.20690	20.224**
7-8 N=129	Class Rank	1.000	7.162*

*P < .01
**P < .001

TABLE 2

PERCENTAGE OF STUDENTS PROPERLY CLASSIFIED BY GROUP USING THE DISCRIMINANT FUNCTION (GRADES 1-3)

Group	N	Prior Probabilities	Hits	Misses	% of Hits Using DFA	% of Hits Beyond Chance Assignments (Kappa)
Revolve In	99	26	27	72	27.3%	19.0%
Not Revolve In	278	74	253	25	91.0%	

TABLE 3

PERCENTAGE OF STUDENTS PROPERLY CLASSIFIED BY GROUP USING THE DISCRIMINANT FUNCTION (GRADES 4-6)

Group	N	Prior Probabilities	Hits	Misses	% of Hits Using DFA	% of Hits Beyond Chance Assignments (Kappa)
Revolve In	304	50	168	136	55%	22%
Not Revolve In	310	50	215	95	69%	

TABLE 4

PERCENTAGE OF STUDENTS PROPERLY CLASSIFIED BY GROUP USING THE DISCRIMINANT FUNCTION (GRADES 7-8)

Group	N	Prior Probabilities	Hits	Misses	% of Hits Using DFA	% of Hits Beyond Chance Assignments (Kappa)
Revolve In	22	17	0	22	0%	0%
Not Revolve In	107	83	107	0	100%	

TABLE 5

PERCENTAGE OF STUDENTS PROPERLY CLASSIFIED BY GROUP USING THE DISCRIMINANT FUNCTION (GRADES 4-6)

Group	N	Prior Probabilities	Hits	Misses	% of Hits Using DFA	% of Hits Beyond Chance Assignments (Kappa)
Complete Project	293	96	293	0	100%	0%
Not Complete Project	11	4	0	11	0%	

TABLE 6

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS AND DISCRIMINANT ANALYSIS F RATIOS FOR THE VARIABLES THAT DIFFERENTIATED BETWEEN STUDENTS WHO COMPLETED PROJECTS IN THE RESOURCE ROOM AND THOSE WHO DID NOT

Grade Level Ranges	Variables	Function 1	Discriminant Analysis F
1-3 N=99	No analysis possible ; only one non-empty group		
4-6 N=304	Academic Self-Concept	1.000	3.989*
7-8 N=22	No analysis possible ; only one non-empty group		

*P< .05

TABLE 7

CORRELATED t-TESTS FOR INTERNALIZATION OF ACADEMIC SUCCESSES (I+) AND FAILURES (I-) (LOCUS OF CONTROL) FOR GRADES 4-6

Variable	N of Cases	X	SD	t-Value	df	P
Internalization of Academic Successes (I+)		14.065	2.175			
	614			23.87	613	.000
Internalization of Academic Failures (I-)		10.824	3.022			

TABLE 8

CORRELATED t-TESTS FOR INTERNALIZATION OF ACADEMIC SUCCESSES (I+) AND FAILURES (I-) (LOCUS OF CONTROL) FOR GRADES 7-8

Variable	N of Cases	X	SD	t-Value	df	P
Internalization of Academic Successes (I+)		14.023	1.779			
	129			9.80	128	.000
Internalization of Academic Failures (I-)		11.892	2.389			

TABLE 9

PERCENTAGES OF CHILDREN WHO REVOLVED IN TO THE RESOURCE ROOM ACCORDING TO CLASS RANK

Grade Level Range	Revolved In To The Resource Room			
	Traditional Group		Expanded Group	
	N	%	N	%
1-3	44	50%	55	19%
4-6	129	68%	175	41%
7-8	16	26%	6	9%
Total	189	47%	236	30%

TABLE 10

PERCENTAGES OF CHILDREN WHO COMPLETED PRODUCTS IN THE RESOURCE ROOM ACCORDING TO CLASS RANK

Grade Level Range	Completed Products In Resource Room			
	Traditional Group		Expanded Group	
	N	%	N	%
1-3	44	100%	55	100%
4-6	125	97%	169	97%
7-8	16	100%	6	100%
Total	185	98%	230	97%

REVOLVING DOOR IDENTIFICATION MODEL:
CHARACTERISTICS OF TALENT POOL STUDENTS

E. Jean Gubbins

The University of Connecticut

INTRODUCTION

Persons involved and interested in special education are continually searching for ways to identify and provide educational programs for gifted children. Yet, even the definition of who these children are remains a question. One definition adopted by researchers, psychologists, and educators has been Terman's (1926) approach to selecting the "top one percent level in general intellectual ability, as measured by the Stanford-Binet Intelligence Scale or a comparable instrument" (p. 43). As an absolute definition of giftedness, educators treated this as a convenient technique for selecting those students who would receive additional curricular experiences. Opposition to this technique of identifying youngsters who were good "test-takers" and/or "lesson-learners" surfaced as research studies revealed the tenuous relationship between IQ tests and subsequent creative accomplishments (Cox, 1926; Hollingworth, 1942; Terman, 1925 and 1926).

Defining giftedness remained a critical issue and solutions were proposed by Witty (1958), who offered a global definition, and by Marland (1972), who supplied categories of giftedness. Although these definitions broadened the conception, Witty's was difficult to operationalize and Marland's was basically tied to locating the top 3-5% of the population in terms of academic ability, or talent in the arts.

Thus, there was a need for an operational definition which would provide guidelines for identification systems and related programming practices. After an extensive review of the literature, Renzulli (1978) advanced an operational definition of giftedness in which the characteristics of creative/productive persons were recognized as three interlocking clusters: above average ability, creativity, and task commitment. These clusters were not independent of each other; rather, it was the interaction of this composite set of traits which was evident when people were involved in creative production.

As a result of this review of literature, Renzulli (1978) found that ability, as measured by achievement or intelligence test scores, did not "necessarily reflect the potential for creative/productive accomplishment" (p. 182). It was obvious that additional characteristics, namely creativity and task commitment, played critical roles in the achievements of productive people. These two characteristics were more difficult to assess through traditional measuring devices, but they were major contributors to the process of solving a particular problem, or executing a specific product.

Now that a definition of "what giftedness is" was aligned with the behavior of individuals, educational efforts could center on providing enrichment activities designed to encourage student involvement with creative production. These educational efforts resulted in a comprehensive and integrated approach to the identification of and programming for gifted students known as the Revolving Door Identification Model (RDIM; Renzulli, Reis, and Smith, 1981). Preliminary studies of RDIM have been conducted by Delisle (1981); Delisle, Reis, and Gubbins (1981; and Reis (1981). Futher studies have been proposed by researchers interested in investigating this new approach to identifying the top 15-25% of the school population, based on ability test scores or teacher nomination (i.e., talent pool), and providing them with

specific types of curricular activities advocated by the objectives of the Enrichment Triad Model (Renzulli, 1977).

This present study was initiated to determine whether this target population of academically above average students would engage in product development as a result of specific programming techniques. In addition, the intellective (e.g., achievement) and non-intellective (e.g., academic self-concept and locus of control) characteristics of students were examined to assess their influence on subsequent involvement with creative production.

Research Procedures

The field testing of the Revolving Door Identification Model in ten Connecticut towns was investigated in an effort to determine its impact on students in grades 4-6. The talent pool students, representing the top 15-25% of the school population based on achievement tests or teacher nomination*, were the subjects for this study of the creative productivity of youngsters. A brief summary of each phase of this quantitative and qualitative study is provided below.

Procedures

For the quantitative phase of the study, the characteristics of achievement, academic self-concept, and locus of control were investigated for the entire population in grades 4-6 across and within specific towns. Information on achievement test scores was available from students' cumulative records. These achievement test scores were used in conjunction with the scores obtained from the administration of the Self-Appraisal Inventory (SAI: Instructional Objectives Exchange, 1972) and the Intellectual Achievement Responsibility (IAR) Questionnaire (Crandall, Katkovsky, and Crandall, 1965) measuring academic self-concept and locus of control, respectively. These quantitative constructs mentioned above influenced a child's decision to become involved with a creative accomplishment.

Because the quantitative phase of the study relied on pre-selected variables which may or may not be primary influences on the creative productivity of gifted youngsters, it was advisable to extend the research to investigate qualitatively why certain students did not initiate or complete products. A series of questionnaire and interview forms** was designed for students, teachers, and parents to reflect the workings of the Revolving Door Identification Model. The Student Questionnaire was administered to those students

---

*Although Renzulli, Reis, and Smith (1981) recommend the use of local achievement or intelligence test scores, or teacher nominations from the first four scales (Learning, Motivation, Creativity, and Leadership) of the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli, Smith, White, Callahan, & Hartman, 1976), it becomes a district's decision as to the exact criteria for the formation of the talent pool.

**The questionnaire and interview forms used in this study are available from the author.

who did not enter the resource room (N = 305) to work on a product. The Student Interview, Resource Teacher Interview, and the Parent Interview were used to provide information about the students who initiated but did not complete products (N = 7).

Quantitative Analyses. Step-wise multiple regression procedures were employed to analyze the quantitative data. In the analyses, achievement, academic self-concept, locus of control for successes, and locus of control for failures were used as the predictor variables for the criterion measure of "revolve" (i.e., entering/not entering the resource room to work on a product). These analyses enabled the examination of the following research question:

> To what extent and in what manner do achievement, academic self-concept, locus of control for successes, and locus of control for failures predict student involvement with product development?

Qualitative Analyses.* For the qualitative data obtained from the questionnaire and interview forms, the analyses centered on noting the consistency of responses as to why certain talent pool students did not initiate or complete products. The following research questions were offered as the basis

1. Are there any factors that might explain why certain talent pool students did not "revolve in" to the resource room to complete a product?

2. What factors, if any, are associated with the non-completion of a product?

RESEARCH METHODS AND PROCEDURES

This section details the quantitative and qualitative approaches used in this research study. The selection procedures for the sample are described first, followed by an explanation of the research design. This section continues with a description of the instruments for measuring academic self-concept and locus of control, as well as with an overview of the techniques for developing the questionnaire and interview forms. A synopsis of the data collection procedures and a review of the quantitative and qualitative analyses employed in this investigation concludes this section.

Sample

Students in grades 4-6 from ten Connecticut towns participating in the field

---

*For the first research question, the term "qualitative" is not used in the strictest sense.

testing of the Revolving Door Identification Model represent the sample for this study (N = 776). The group includes youngsters from various demographic and ethnic backgrounds in urban, suburban, and rural areas of the state.

These students qualified for the town's talent bool based on at least one of the following criteria:

1. Top 15-25% of the general school population identified by scores on standardized achievement tests;

2. Teacher nomination, as indicated by the Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS; Renzulli, Smith, White, Callahan, & Hartman, 1976).

For purposes of the quantitative analyses, the characteristics of achievement, academic self-concept, locus of control for successes, and locus of control for failures were investigated as potential correlates of creative production across nine towns (N = 430)*, and across and within four towns (01, 04, 07, and 09) which had sufficient sample sizes for analyses with four predictors.

Qualitative analyses were performed for two groups: (1) students who did not "revolve in" to the resource room (N = 305)**; and (2) students who "revolved in" but did not complete products (N = 7). In addition to focusing on the students who were non-completors of products (Group 2), data were obtained from their parents, resource teachers, and classroom teachers.

Research Design

Quantitative and qualitative methods were used to assess the effectiveness of implementing the Revolving Door Identification Model. The causal-comparative method was selected for the quantitative analyses of the characteristics of young creative producers. This was considered to be an appropriate procedure in the real world school environment, but there were definite limitations. Isaac and Michael (1971) cite the following weaknesses: (1) the lack of control over independent variables; (2) the difficulty in being sure that the causative factor is among the selected variables; and (3) the complication that an interaction of factors may produce the outcome. Because of these weaknesses in the causal-comparative method, a qualitative investigation was designed to extend the research on the youngsters participating in RDIM.

---

*Number of subjects and towns for the quantitative analyses is lower than the total sample of 776 students in 10 towns due to the following reasons: (1) the default option of listwise deletion of missing data was operative in the regression analyses; (2) one town was eliminated due to lack of total battery achievement test scores; and (3) some cases were not part of the analyses because of achievement test scores below 75.

**The actual number of talent pool students from the total sample in grades 4-6 (N = 776) who didn't "revolve in" to the resource room was 356. For qualitative research question one, 305 questionnaires were returned (86% response rate); therefore, 14% of the data were missing.

The qualitative investigation involved the use of questionnaire and interview forms for students, parents, and teachers which provided information as to why some students did not initiate or complete products.

Instrumentation

In this section, details related to the instruments for the quantitative and qualitative phases of the study will be presented. First, for the quantitative analyses, the available forms of achievement test scores will be mentioned, and then the specifics of the Self-Appraisal Inventory and the Intellectual Achievement Responsibility Questionnaire will be described. Second, the process of creating the questionnaire and the interview forms for the qualitative analyses will be reviewed.

Quantitative Information

Achievement Test Data. Three forms of achievement test scores were made available to the researcher: (1) total battery scores - national percentiles, nine field test sites; (2) total battery scores - local percentiles, six of these same field test sites; and (3) subtest scores in reading and mathematics only, one field test site. (This last site was excluded from the analyses due to the non-comparability of its data.) Since national percentiles were the common measure for the majority of field test sites, these data were used. However, the percentiles were transformed in Normal Curve Equivalents (NCEs) using a table constructed by Tallmadge and Wood (1976). These transformed scores have an advantage over percentiles because NCEs are normalized standard scores ($\bar{X}$ = 50; SD = 21.06)* which, unlike percentiles, provide an equal interval scale--"that is, the length of the interval between any two adjacent scores on the scale is equal to the interval between every other adjacent pair of scores" (Tallmadge & Wood, 1976, p. 8).

Quantitative analyses were performed with local percentiles, national percentiles, and normal curve equivalents. The resulting data were quite similar. Because of these similarities, only one form of achievement test scores will be reported, that of Normal Curve Equivalents. NCEs were selected for two reasons: (1) these scores are on an equal-interval scale, as noted earlier; and (2) these scores are more appropriate when data are aggregated across towns administering different achievement tests.

Academic Self-Concept Measure. The Self-Appraisal Inventory (SAI: Instructional Objectives Exchange, 1972) was used as the measure of affective learner goals. This self-report inventory has four subscales on self-concept;

---

*"The NCE standard deviation of 21.06 was derived by dividing the distance from the mean to the 99th percentile (99 - 50 = 49 percentile points) by the same distance measured in terms of normal curve standard deviation units (2.3267 - 0 = 2.3267). The result (49 ÷ 2.3267 = 21.060) yields a scale which includes exactly 98% of the population between values of 1 and 99" (Tallmadge & Wood, 1976, p. 8).

general, peer, family, and scholastic. For this study, the scholastic scale (intermediate version) was chosen because of its relevancy to the activities in RDIM. The scale contains 20 items to which students respond "true" or "untrue" to statements reflecting school abilities. The test-retest reliability (two-week interval) sampled at grades 4-6 (N = 150) was .78; internal consistency was .81 (N = 73). Validity data were not reported.

Locus of Control Measure. In order to assess students' beliefs in reinforcement responsibility in academic settings (i.e., locus of control), the Intellectual Achievement Responsibility (IAR) Questionnaire (Crandall, Katkovski, & Crandall, 1965) was selected. This scale is composed of 35 forced-choice items. Each item stem describes a typical achievement experience in school. Following the positive or negative stem, there are two statements: one declaring the event was caused by the student, and one attributing the event to someone else in the environment.

The IAR was constructed to yield a total I (internal) responsibility score and separate scores for beliefs in classroom successes (I+) and classroom failures (I-). The test-retest coefficients (two-month interval) sampled at grades 3 - 5 (N = 47) were .69 for total I, .66 for I+, and .74 for I-. Internal consistency estimates via the split-half method corrected by the Spearman-Brown Prophecy Formula were .54 for I+ and .57 for I- (grades 3 - 5; N = 150). No information was available on the validity of this instrument.

Qualitative Information

Questionnaire and Interview Forms. Locally-developed questionnaire and interview forms were created to address qualitative research questions 1 and 2, focusing on students who did not initiate or complete products. The methods employed in this process were as follows: (1) creating an item pool; (2) examining content validity; and (3) conducting the field test. The first stage involved generating a preliminary pool of items with the assistance of resource teachers, parents, and graduate students familiar with RDIM. Drafts of the forms were reviewed by this initial group of nine people.

To insure content validity, the second stage of the process included a review of the forms by 12 expert judges. These judges consisted of the following persons: creators of RDIM (N = 2); research and measurement specialists (N = 2); resource teachers (N = 2); classroom teachers (N = 2); parents (N = 2); and graduate students (N = 2). Based on their feedback, items were redrafted and resubmitted to the judges for a final review.

Because the forms were targeted for specific people, the field test was conducted in Simsbury, Connecticut with talent pool students (N = 12), teachers (N = 6), and parents (N = 4) who would not be eventual respondents. This field test group was involved in a role-playing situation in which they were either a talent pool student who did not initiate or complete a product, or a parent, resource teacher, or classroom teacher of a talent pool student who did not complete a project. This technique allowed the researcher to check the clarity of the statements, and to review the questions about the implementation of RDIM. This third stage in the development of the forms yielded specific questions that were added to the last draft of the Student

Questionnaire, Student Interview, Resource Teacher Interview, Classroom Teacher Interview, and Parent Questionnaire.

The above techniques were critical to establishing content validity. The reliability of the forms was a lesser concern. However, it was important to verify the comparability of responses for qualitative research question 2 among the groups of students, teachers, and parents. Therefore, similar questions appear in each of the interview and questionnaire forms which should provide corroborating information as to why specific students did not complete products.

Data Collection Procedures

In each of the 10 towns, one person was designated by the superintendent of schools as the coordinator for testing and data gathering. This designee attended a meeting in January 1981 at the University of Connecticut to receive instructions from the research team regarding the administration of the Self-Appraisal Inventory and the Intellectual Achievement Responsibility Questionnaire. All necessary forms were made available to the coordinator who, in turn, provided the instructions to the resource teachers. These teachers administered the SAI and IAR to talent pool students in February 1981 during one 30-minute class session. Following this session, the coordinator collected the data and forwarded them to the University for hand scoring by the research team.

The present RDIM data base established by Delisle's research (1981) was extended by using the following techniques: collecting and analyzing achievement test scores; conducting interviews; and administering questionnaires. Coordinators and/or resource teachers were asked to provide the researcher with a copy of the Class Survey Sheet indicating the achievement test scores of talent pool students (total battery scores - local and/or national percentiles.)

On-site interviews of talent pool students, resource teachers, and classroom teachers were conducted by the researcher at the end of the 1980-81 school year in an effort to determine which factors may explain why students did not complete products. Additional information about this group was obtained through the Parent Questionnaire.

The final phase of data collection concerned the administration of the Student Questionnaire by the coordinators and/or resource teachers during one 10-minute class session. This form was designed to assess why projects were not initiated.

Quantitative and Qualitative Analyses

A series of step-wise multiple regression procedures* was used to analyze the quantitative data. Three separate analyses were generated: Analysis A: Total Sample; Analysis B: Across Four Towns that had a sufficient

---

*Statistical Package for the Social Sciences (SPSS) procedure.

Sample size (N = 50+) for regression equations with four predictors; and Analysis C: Within Each of the Four Towns (Towns 01, 04, 07, and 09 from Analysis B). In each set of analyses, achievement (NCEs), academic self-concept, locus of control for successes, and locus of control for failures were the predictor variables for the dichotomous criterion variable of "revolve" (i.e., entering/not entering the resource room to complete a project). The purpose of the analyses was twofold: (1) to determine the amount of variance accounted for by the most potent predictor, that is, the first variable to enter into the step-wise procedure; and (2) to identify the total amount of variance through the inclusion of the most effective variables from among the remaining predictors. In this manner, the following quantitative research question was examined:

> To what extent and in what manner do achievement, academic self-concept, locus of control for successes, and locus of control for failures predict student involvement with product development?

Following the quantitative analyses of the relative importance of the above-mentioned predictors on a student's decision to become involved in product development, two qualitative questions were addressed:

1. Are there any factors that might explain why certain talent pool students did not "revolve in" to the resource room to complete a product?

2. What factors, if any, are associated with the non-completion of a product?

Regarding qualitative research question 1*, descriptive statistics were used to interpret the data obtained from the Student Questionnaire. More specifically, the data analyses procedures involving frequencies proceeded in four stages. First, the percent of students who were involved in Type I: General Exploratory Activities and Type II: Group Training Activities was determined across 10 towns, and within and across Towns 01, 04, 07, and 09. Second, the Type I Activities listed by talent pool students were reviewed and subsequently assigned to content areas (e.g., Science, Computer/Mathematics, Social Studies, etc.). Third, the Type II Activities were classified according to specific categories (e.g., Creative Thinking; Critical Thinking; Affective Activities; Learning How to Learn Skills; Research and Reference Skills; and Mini-courses). After the assignment procedure, the percent and frequency of student participation in each enrichment activity were recorded. Finally, in the fourth stage, the reasons why certain talent pool students were not involved in product development were accounted for by obtaining the percentage for each explanation selected or added by the students.

---

*Since descriptive statistics were used in response to this research question, there was a liberal interpretation of the term qualitative research.

Table 1

Descriptive Statistics on Predictor Variables

by Revolve for the Total Sample

	Revolve[a]			
	Yes		No	
Predictor Variable	Mean	SD	Mean	SD
Achievement	88.63	8.11	85.36	7.87
Academic Self-Concept	17.61	2.65	16.63	2.78
Locus of Control - Successes	14.31	2.08	13.91	1.97
Locus of Control - Failures	10.66	3.09	10.65	3.01

Note. Revolve - Yes or No refers to students who did/did not engage in Type III: Individual and Small Group Investigations of Real Problems.

[a]Number of students in each group is as follows: Revolve - Yes (N = 242); and No (N = 188).

Relative to qualitative research question 2, the Student Interview, Resource Teacher Interview, Classroom Teacher Interview, and Parent Questionnaire were reviewed for specific trends and patterns which might explain why certain talent pool students initiated but did not complete individual or small group projects. The data from the various forms were synthesized for each of the seven children in this phase of the research study.

Results of the Study

After an overview of some preliminary data, the results of this study on the implementation of the Revolving Door Identification Model in grades 4-6 will be presented in three sections. In the first section, the effectiveness of predicting student involvement with product development will be assessed by examining step-wise multiple regression procedures associated with the quantitative research question; in addition, supporting data from crosstabulations on each variable will be reviewed. Next, the analysis of the Student Questionnaire, focusing on the frequency and the type of enrichment experiences, as well as on the possible reasons for the lack of involvement with a project, will be described in response to qualitative research question 1. And finally, in the third section, qualitative research question 2, regarding incompleted products, will be addressed through a summary of comments made by students, teachers, and parents on their respective questionnaire and interview forms.

Qualitative Research Question: Predicting Product Development

Some Preliminary Data

The quantitative data for this study were analyzed using step-wise multiple regression procedures for the following research question:

> To what extent and in what manner do achievement, academic self-concept, locus of control for successes, and locus of control for failures predict student involvement with product development?

The criterion measure was designated as "revolve", a dichotomous variable referring to students who did or did not enter the resource room to complete a product. The four predictor variables were achievement (artifically dichotomized variable using Normal Curve Equivalents (NCEs) of (75-94) and (95-99), academic self-concept, locus of control for successes, and locus of control for failures. Table 1 portrays the descriptive statistics for each of the predictors by "revolve" across the total sample. On all four predictors the students who "revolved in" to the resource room had higher mean scores, but the differences were quite small. When these same statistics were generated within and across the subset of four towns, there were some minor changes. Within towns, students who "revolved in" to the resource room outperformed the other students on academic self-concept (possible range 0-20) (Towns 01, 04, 07, and 09); achievement (range 75-99) (Town 01, 07, and 09); locus of control for successes (possible range 0-17) (Town 01, 04, and 07); and locus of control for failures (possible range 0-17) (Town 04). Students who did not "revolve in" scored higher on achievement (Town 04); locus of control for successes (Town 09); and locus of control for failures (Towns 01,

07, and 09). Lastly, in the analysis across four towns, the scores achieved by the "revolved in" students exceeded those of the other students on all constructs but that of locus of control for failures.

Multiple Regression Results

Three sets of multiple regression analyses were performed: (1) Analysis A: Total Sample; (2) Analysis B: Across Four Towns with a sufficient population (N = 50+) to warrant the inclusion of four predictor variables; and (3) Analysis C: Within Each of the Four Towns (Towns 01, 04, 07, and 09 from Analysis B). The predictor variables were entered into the regression equation in a step-wise inclusion format, allowing the variable that explains the largest amount of variance in the criterion to enter first. Then, the variable that accounts for the next largest amount of variance, in conjunction with the first variable, is introduced into the equation. This procedure continues until all variables meeting the statistical criteria are considered. Each set (i.e., Analyses A, B, and C) of the step-wise multiple regression procedures will be described in turn.

Analysis A: Total Sample. The effectiveness of the constructs of achievement, academic self-concept, locus of control for successes, and locus of control for failures in predicting which students will "revolve in" to the resource room to execute a product is based initially on the correlation of each predictor with the criterion. Academic self-concept and achievement have the highest correlations with "revolve" (r = .77 and r = .124, respectively), while the magnitude of the remaining correlations is so low there will be little or no impact in the regression procedure. With these preliminary data, it is possible to predetermine the likelihood of obtaining an effective prediction equation.

Inspection of the entries in Table 2 reveals that academic self-concept is the variable entered in Step 1 with a correlation of .177 and R^2 of .031. Thus, this construct accounts for 3% of the variance in the criterion. Further information provided in Table 2 indicates multiple R coefficients ranging from .207 to .211 and accompanying R^2s from .043 to .045. In addition, despite the significance of the F-values for incremental validity at Step 1 ($p < .01$) and Step 2 ($p < .05$), only another 1% of the variance is explained with the inclusion of the achievement variable. It should be noted that after Step 2 the standard error (SE) increases, illustrating the decreasing effectiveness of the relationship between predictor and criterion.

Analysis B: Across Four Towns. This multiple regression procedure was performed on a subset of the data above. Towns 01, 04, 07, and 09 were selected for additional study, including both across and within analyses, because of sufficient sample sizes, as mentioned earlier. First, the across town analysis will be reviewed; then, a brief summary of the within town analyses will be provided under the section entitled Analysis C: Within Each of the Four Towns.

In Table 3, the subset analysis across Towns 01, 04, 07, and 09 closely parallels the pattern established in Analysis A. The variable of academic self-concept enters into the equation first with a correlation of .196 with "revolve." Therefore, about 4% of the variance in "revolve" is accounted for

Table 2

Step-Wise Multiple Regression Results

Using Achievement, Academic Self-Concept,

and Locus of Control as Predictors,

Analysis A: Total Sample

(N = 430)

Step	Variable Entered	Multiple R	R^2	SE	F^a
1	Academic Self-Concept	.177	.031	.48936	13.81*
2	Achievement	.207	.043	.48702	5.14**
3	Locus of Control - Successes	.211	.044	.48718	0.72
4	Locus of Control - Failures	.211	.045	.48768	0.12

[a] F-value reported here is for incremental validity.

*$p < .01$.

**$p < .05$.

Table 3

Step-Wise Multiple Regression Results

Using Achievement, Academic Self-Concept,

and Locus of Control as Predictors,

Analysis B: Across Four Towns

(N = 323)

Step	Variable Entered	Multiple R	R^2	SE	F^a
1	Academic Self-Concept	.196	.038	.49156	12.80*
2	Achievement	.211	.044	.49076	2.05
3	Locus of Control - Failures	.217	.047	.49086	0.83
4	Locus of Control - Successes	.217	.047	.49165	0.02

[a] F-value reported here is for incremental validity.

*p < .01.

by academic self-concept. Further, once again, the standard error (SE) increases after Step 2.

At Step 2 in Table 3, the results from Analyses A and B begin to diverge. The addition of the achievement variable does not result in statistical significance. Also, the order of the last two variables is reversed with locus of control for failures entering at Step 3, followed by locus of control for successes at Step 4.

Analysis C: Within Each of the Four Towns. The final multiple regression analyses were conducted with Town 01 (N = 116); Town 04 (N = 69); Town 07 (N = 58); and Town 09 (N = 80). A general overview of the results is provided below.

The within town analyses are in slight contrast to Analyses A and B. In all but one town, academic self-concept was the first variable to enter the regression equation. In this exceptional case locus of control for successes entered in Step 1 (Town 01). At the second step, the order of predictors is as follows: achievement - Towns 01 and 07; and locus of control for successes - Towns 04 and 09. Once again, however, only a small amount of variance is explained by the predictors (range 3% - 6%) with the later percentage occurring in Town 04 with academic self-concept. Furthermore, these within town analyses revealed that just one construct, that of academic self-concept, was a significant contributor to prediction at the conventional .05 level of significance, and this was restricted to the analysis completed for Town 04.

Summary of Multiple Regression Results

Of the intellective (i.e., achievement) and non-intellective (i.e., academic self-concept and locus of control) constructs selected as potential predictors of product development, academic self-concept was the significant variable to enter first in the step-wise regression procedure across the total sample (Analysis A). The variable was succeeded by achievement in the second step of the regression equation, explaining approximately 4% of the variance in the criterion of "revolve." This small percentage was maintained for academic self-concept alone in Analysis B and increased slightly to 6% in the within town analysis (Analysis C) for Town 04. In this within town analysis, however, none of the remaining variables achieved significance. The practical considerations and implications of these findings will be discussed later.

Qualitative Research Question 1: Student Questionnaire Data

Introduction

A major objective of the Revolving Door Identification Model is to expose academically above-average students to specific types of activities advocated by the Enrichment Triad Model.

A brief explanation of the three types of specific curricular experiences advocated by the model is provided here for the reader:

Type I: General Exploratory Activities are designed to provoke students' interests in new topics through interactions

with professionals, presentations via multi-media, and attendance at demonstrations or classes with community resource people.

Type II: Group Training Activities consist of techniques for cognitive-affective skills; learning how to learn skills; advanced research and reference skills; and written, oral, and visual communication skills.

Type III: Individual and Small Group Investigations of Real Problems are a major component of the model. Students become actual investigators of interest-based problems. These problems are resolved through various methods of inquiry and results are presented to appropriate audiences.

As a result of these preliminary experiences with Type I: General Exploratory Activities and Type II: Group Training Activities, students may or may not pursue additional enrichment, namely Type III: Individual and Small Group Investigations of Real Problems. Althouth this is the planned curricular approach, many students don't engage in Type III Activities during the field testing of RDIM. In fact, this was true for 45.9% of the total talent pool population ($\underline{N}$ = 776) across 10 towns.* It is this group of students, then, that become the subjects for the first qualitative research question:

> Are there any factors that might explain why certain talent pool students did not "revolve in" to the resource room to complete a product?

In response to this research question, Student Questionnaire data from 305 talent pool students were analyzed across 10 towns, and within and across the subset of 4 towns included in the regression analyses (Towns 01, 04, 07, and 09). (Other within town analyses were eliminated due to the small number of students per town.)

For purposes of data reduction, the results of the Student Questionnaire were divided into four sections: (1) percentage of students participating in Type I: General Exploratory Activities, and Type II: Group Training Activities; (2) frequency and percent of student involvement in Type I Activities by content areas; (3) frequency and percent of student involvement in Type II Activities by categories; and (4) reasons why students didn't engage in Type III: Individual and Small Group Investigations of Real Problems. Each of these four sections of the questionnaire will be described in detail.

---

*For the regression analyses in the previous section, only nine towns were included due to the dependence on specific test scores. In the analyses for qualitative research question 1, however, data from the 10 field test sites were used.

Participation in Type I and Type II Activities

It is important to note that 14.8% of this particular group of talent pool students across 10 towns, who did not pursue Type III Activities, did not attend any Type I Activities (e.g., tour of a solar home; visit to a planetarium; presentation by an architect, computer specialist, or author; lecture on rocks and minerals; or film on the history of motion pictures). Furthermore, 17% were not involved in Type II Activities (e.g., mini-courses--foreign language, sign language, calligraphy; workshops in creative thinking and problem solving; camera techniques for film making; television production skills; or session on advanced library skills). These percentages fluctuate in the within town analyses and are relatively stable across the subset of four towns. The range of the lack of involvement in Type I Activities is from 2.6% to 30.7% with the lowest percentage recorded for Town 04, and the highest percentage for Town 09. This pattern changes when the Type II Activities are considered: 8% of the students in Town 09, and 41.4% in Town 07 didn't participate in these activities.

Now that the extent of involvement in preliminary enrichment experiences has been examined, the focus of the questionnaire analysis turns to the specific Type I and Type II Activities selected by students across 10 towns, and within and across 4 towns. The data on the Type I Content Areas will precede a review of the Type II Categories.

Student Involvement in Type I Content Areas

Students were asked to list the Type Activities in which they had participated during the 1980-81 school year. In order to establish some possible trends in the data obtained from all respondents, the lists from the 305 students were classified in terms of 11 content areas. In addition to the classification scheme, the frequency of involvement in a specific content area was determined for each student (range 0=3+). The actual range of involvement was from 0 - 9, with Science as the activity occurring most frequently.

The analysis of these data indicate it is evident that limited Type I Activities (frequency - 0)* were selected in the following areas: Foreign Language (97.4%); Sports(95.7%); Crafts (93.8%); Language Arts (89.8%); Music and Drama (88.5%); Computers/Mathematics (83.9%); Art (83.0%); and Media (75.4%) whereas the following were experienced at least 30% of the time (collapsing across frequencies 1 - 3+): Science and Social Studies. In fact, 62.9% of the time students chose Science activities, and 34.5% of the time (frequencies 1 - 3+) they participated in Social Studies activities.**

---

*This means that the students did not participate in any of these activities.

**It should be noted that information related to the actual list of all the enrichment activities offered in specific content areas throughout the school year was not available; therefore, the interpretation of the questionnaire data rests with the students' selected activities.

The analysis of student involvement in Type I content areas continues as the data within and across Towns 01, 04, 07, and 09 are studied. The population for the analysis across towns consisted of 231 students, which is 76% of the available population; thus, it is possible that the preceding findings would be replicated. There is a slight increase in the percentage of involvement in Science to 64.8% (frequency 1 - 3+) and a slight decrease in Social Studies to 28.6% in the analysis across four towns.

For a summary of the within town analyses, all the data have been reduced to considering which content areas were pursued at least 30% of the time (frequency 1 = 3+). This approach to the interpretation provides a synopsis of the more popular content areas: Town 01 - Science (67.9%), Social Studies (49.2%), and Art (37.3%); Town 04 - Science (39.9%) and Social Studies (46.2%), as well as Language Arts (46.1%), Music (46.2%), and Drama (38.5%); Town 07 - Science (75.9%); and in Town 09, none of the content areas met the established criterion.

Given that Type I Activities have a dual purpose--stimulating new interests in a wide variety of disciplines and guiding the direction of Type II offerings--it is important to document the extent to which students selected skill-based activities that develop thinking and feeling processes, namely Type II: Group Training Activities. The next section examines the scope of these activities as recorded by students who subsequently chose not to initiate projects.

Student Involvement in Type II Categories

The Type II: Group Training Activities have been divided into several categories. Each of these is described and illustrated briefly in Table 4.

An analysis of student involvement in Type II Activities proceeded in the same fashion as it did for the Type I Activities. The lists of experiences from the Student Questionnaire were reviewed and classified according to the above-mentioned categories.

After the classification process, the frequency (0 - 3+) of each activity was determined across 10 towns, and within and across 4 towns. For this part of the questionnaire, the actual range of activities was 1 - 6, with Critical Thinking and Mini-courses receiving the highest frequency.

As to the frequency and percent of involvement in Type II Activities across 10 towns, there was little or no involvement (frequency - 0) with several of the categories. More specifically, 95.4% of the time students had no experiences with Affective Activities; 91.8% - Learning How to Learn Skills; 90.2% - Research and Reference Skills; and 78.7% - Written, Oral, and Visual Communication Skills. On the positive side, at least 30% (frequency 1 - 3+) of the time students were involved in Creative Thinking (41.7%), Critical Thinking (32.8%), and Mini-courses (43.7%).

The analysis across 4 towns replicates the one for across 10 towns. Several of the talent pool students participated in the Type II Activities (frequency 1 = 3+) of Creative Thinking (45.4%), Critical Thinking (38.4%), and Mini-courses (39.4%), while very few of them experienced Affective

Table 4

Categories of Type II:

Group Training Activities

Category	Objectives	Illustration
Creative Thinking	To develop skills in brainstorming and creative problem solving.	creating imaginary or realistic solutions to problems: What would happen if all your dolls could talk? How could you design a passive solar heating system for your home?
Critical Thinking	To develop abilities in analyzing, synthesizing, and evaluating information; deductive thinking skills; nypothesizing.	solving logic problems; comparing and contrasting results of original experiments
Affective Activities	To develop an understanding of self and others.	training in group dynamics; role-playing or simulating specific situations
Learning How to Learn Skills	To develop skills in notetaking, interviewing, classifying, and analyzing data.	graphing and interpreting weather data; preparing interview questions for a genealogy project
Research and Reference Skills	To develop skills in using advanced-level resources such as abstracts, reader's guide, and directories.	attending sessions on reference materials at a local university library; scanning reference materials for latest periodicals on a specific topic

Table 4 (Continued)

Category	Objectives	Illustration
Written, Oral and Visual Communication Skills	To develop techniques of producing professional quality products.	practicing calligraphy, filmmaking techniques, and television production skills
Mini-courses	To stimulate interest and involvement in specialized content areas.	course offerings in herpetology, law, computers, alternate energy, and chronobiology

Note. For data analysis purposes, the category of Cognitive and Affective Processes, has been divided into Creative Thinking, Critical Thinking, and Affective Activities. Also, the category of Mini-courses has been added.

Activities; Learning How to Learn Skills; Research and Reference Skills; and Written, Oral, and Visual Communication Skills.

The within town analyses reveal that more than 30% of the time (frequency 1 - 3+) students in Towns 01, 04, and 09 had opportunities with Creative Thinking and Critical Thinking; in addition, students in Towns 04, 07, and 09 also participated in Mini-courses. Less than 30% of the time students were involved in Affective Activities in Towns 01, 04, and 09; Learning How to Learn Skills - Towns 01 and 09; Research and Reference Skills - Towns 01 and 09; Written, Oral, and Visual Communication Skills - Towns 01, 07, and 09. Finally, the data indicate that none of the students had worked with Mini-courses in Town 01; Learning How to Learn Skills; Research and Reference Skills; and Written, Oral, and Visual Communication Skills in Town 04; and Affective Activities; Learning How to Learn Skills; and Research and Reference Skills in Town 07.

Talent pool students who did not initiate projects were armed with a variety of enrichment experiences in which their roles were essentially that of a consumer of knowledge for Type I presentations, or perhaps a participant in instructional methods and materials of Type II exercises. If Type I and Type II Activities are the preparatory experiences for creative production, why is it that almost one-half of the total talent pool population did not engage in Type III investigations? The students' responses to this question are detailed below.

Reasons for Lack of Involvement in Type III activities

The last section of the Student Questionnaire centers on reasons why students did not "revolve in" to the resource room to develop a product. Students were asked to review the list of 16 possible reasons and check all that were applicable. Also, they were encouraged to record any additional reasons that did not appear in the prepared list. Many of the 305 talent pool students responded to this option. As a result, their statements were categorized and rephrased for the extended list in the analyses across 10 towns, and within and across 4 towns.

Regarding the analysis across 10 towns, the 5 most frequently occurring responses were as follows:

I haven't had an idea for an individual or small group project (61.3%).

I would have to make up any class room work that I missed (45.1%).

I have a full schedule in school (44.4%).

I am involved in special activities after school (30.1%).

I am not familiar with the kinds of projects completed in the resource room (21.9%).

It appears that factors dealing with the creation of potential project ideas and those concerned with time management partially explain the lack of product development. At this point, it is important to establish whether this pattern is consistent in the analyses within and across towns 01, 04, 07, and 09.

In the analyses within towns the same four reasons seem to impact on the students' decision not to become involved in Type III activities, with just one exception in Town 04 due to a tie score. The additional reason was "I am not interested in completing a special project in the resource room."

As to the fifth reason, there was very little consensus among the towns. The following list illustrates this divergence: "I have a full schedule in school." - Town 01 (52.5%); "I am not familiar with the kinds of projects completed in the resource room." - Town 04 (28.2%) and Town 07 (25.9%); "I needed help to define my interests." - Town 09 (16.0%).

A final review of reasons through a summary of the analysis across four towns does not result in the inclusion of new items. In fact, all the reasons appeared in the analysis across 10 towns; the only difference is that the order is changed slightly. Apparently, the major reasons for not working on a Type III investigation were within the original list. Moreover, after accounting for the first five reasons with the highest percentages, the remaining choices were selected infrequently.

Summary of Student Questionnaire Analyses

Talent pool students who didn't engage in product development represented a significant proportion of the academically above-average population participating in the field testing of the Revolving Door Identification Model. They did, however, select a medley of Type I and Type II Activities throughout the school year. From the questionnaire analyses, it was evident that Science and Social Studies were the Type I Content Areas of interest; also, the Type II Categories of Creative Thinking, Critical Thinking, and Mini-courses seemed to be the popular skill-based activities.

As to the reasons for not becomming involved in producing a product, two factors were highlighted consistently in the analyses: lack of project ideas, and difficulty in allocating time for product development due to full schedules and classroom assignments.

Qualitative Research Question 2: Interview and and Questionnaire Data on Non-Completors

Introduction

Designing curricular modifications for gifted youngsters has been facilitated by the availability of the Enrichment Triad Model. This model acts as a guide for developing differentiated experiences in terms of content (Type I: General Exploratory Activities); processes (Type II: Group Training Activities); and products (Type III: Individual and Small Group

Investigations of Real Problems). It is this latter form of differentiation that is unique to Triad because this is where students become actual investigators of specific interest-based problems. Throughout the investigative process, they are cast in the roles of professionals who access advanced levels of resources to bring these problems to resolution. Some students who initiate these Type III investigations decide not to complete their work. As a result, the following qualitative research question has been posed:

> What factors, if any, are associated with the non-completion of a project?

Key Features of the Interview and Questionnaire Forms

For qualitative research question 2, interview and questionnaire forms were developed containing several key features related to product development (see Table 5). These key features recur, when appropriate, in the instruments designed for students, resource teachers, classroom teachers, and parents. Many of these features are self- explanatory, but two terms need clarification: (1) action information message - "light bulb" and (2) intake interview. The action information message is a form, completed by teachers or students, describing a situation in which high levels of interest, task commitment, or creativity have been displayed by an individual, or small group of students. In addition, persons completing the forms, which are designed as light bulbs, are asked to record ideas for activities, resources, or Type III Activities.

The second term, that of the intake interview, is a follow-up process for the action information message. After the message, or light bulb, has been completed and forwarded to the resource teacher, an interview with the individual, or small group of students is scheduled. During this intake interview, the resource teacher, and possibly the classroom teacher, pose questions related to the level of interest and commitment to the idea. Also, this is the time when the initial project idea is focused into a solvable problem. The last purpose of the intake interview is to discuss building some flexibility into the school schedule in order to allocate time for product development.

Responses to the Interview and Questionnaire Forms

The key features of the action information message and the intake interview, along with the others in Table 5, may prove to be probable causes for the non-completion of a product. But, of course, the actual factors can only be identified accurately by the particular group of students (N= 7) who were the subjects for qualitative research question 2. Comments from the students, resource teachers, classroom teachers, and parents have been summarized briefly.

Student A

Project Idea - Write a research report on Mars and design a model.

As a result of some work on astronomy in the classroom, Student A

Table 5

Key Features of the Interview and

Questionnaire Forms for Students,

Teachers, and Parents

Key Features	Student Interview	Resource Teacher Interview	Classroom Teacher Interview	Parent Questionnaire
1. Favorite school subject/academic strength	x		x	x
2. Preliminary work		x	x	
3. Action information message - "light bulb"	x	x		
4. Intake interview	x	x	x	
5. Interest level	x	x	x	x
6. Time commitment	x	x	x	x
7. Task commitment	x	x	x	x
8. Human and material resources	x	x		x
9. Reason for non-completion	x	x	x	x
10. "Revolve in" again	x			x

became fascinated with the planet Mars. She wanted to complete a research report on the latest findings about this mysterious red planet, and to display its features graphically through a model. The student initiated a light bulb and was subsequently interviewed by the resource teacher. Because the project idea was already focused on a particular subject and product, the student "revolved in" to the resource room to begin her research. As a way of organizing this research, the student, with the help of the resource teacher, filled out a management plan which is a detailed outline of the process of developing a product.

Over a period of two months, the student devoted two hours a week to her project. After this time period, the student's interest in the topic began to wane. She stated that the topic "got boring". Student A decided not to continue with her project idea.

Student B

Project Idea - Create a weather map and track information for a daily television broadcast.

This student was also interested in completing a science project. This time the topic centered on meteorology, as Student B planned to be the school meteorologist for a daily television broadcast. She filled out a light bulb describing her idea and met with the resource teacher to review her plans.

Student B completed preliminary work on her topic in the classroom prior to "revolving in" to the resource room for extended research. In addition to culling information from local libraries, the student asked her father, a scientist, to be a mentor. The project work continued for three weeks (about two to three hours per week) before Student B met with the resource teacher to discuss her plans for "shelving" the project. The student felt the time commitment was interfering with her classroom work. She would rather spend time "working in the classroom to get into a higher reading group."

Student C

Project Idea - Write a children's book about a horse.

Student C's favorite subject was reading, and she wanted to write a book about horses for other children. She completed a light bulb and reviewed her project plans with the resource teacher during the intake interview. The resource teacher helped her to organize the story plot and develop the characters. This information was transferred to the management plan, outlining the steps necessary for project completion. The student was highly motivated about the project and discussed it frequently with her parents and with her friends in the resource room. From September to November, she spent time writing, editing, and rewriting the first chapter.

She found the process to be very difficult because she really needed "more information and more help." Student C decided not to complete her book.

Student D

Project Idea - Organize a school newspaper.

Student D wanted to reintroduce a school newspaper, which had been a popular activity a year ago. As editor of the project, she spent time reviewing materials submitted by students, and managing related tasks. As the weeks passed, the student became uninterested in the project. In addition, scheduling time for the newspaper work became difficult. Therefore, this project was shortlived.

Student E

Project Idea - Create names for large scale numbers.

After viewing a chemistry filmstrip indicating that many large scale numbers haven't been named, two students became interested in creating these names. The resource teacher filled out the light bulb for the project idea, and the students began their preliminary work at the local library. Student E wrote letters of inquiry to the Bureau of Standards and patent office asking about regulations for submitting the names; responses were not forthcoming.

The two students continued the project for four months (about three times a week in the early stages, and once a week later on). During this time, a local reporter wrote an article about the project after interviewing Student E. The reporter incorrectly assigned Student E the credit for the project idea. This upset the student because he knew that his friend "owned" the idea. As time passed, Student E's motivation for the project decreased. He said he just "lost interest" in what he was doing.

Student F

Project Idea - Write a research report on a former president.

Student F enjoyed social studies activities and became particularly interested in the life of a former president. He conducted some preliminary research in the classroom and later continued this work in the resource room over a period of several months (two hours a week). His research was quite extensive, and his classroom teacher commended his excellent organization and notetaking skills.

Student F wrote a letter to a family member of the former president. He wanted information about early childhood experiences that he couldn't find in other sources. Several months passed before a response was received. During this "lag time," the student's commitment to the task dwindled and it was never completed.

Student G

Project Idea - Write a book on the architectural design of spaceships.

Apparently, Student G had several projects in mind when he completed his light bulb for the resource teacher. He knew that he wanted to write a book on the architectural design of spaceships. But, perhaps he could also extend this project idea to make some models for a movie, as indicated on his management plan. He worked on the complex project(s) from September to March. During this time, and with the aid of local resources, he conducted a considerable amount of research. In addition, he had an opportunity to interview a space scientist. The time commitment became too difficult to manage, and Student G "just stopped coming to the resource room."

From the results of the interview and questionnaire data, four factors, which were also designated as key features, have emerged as having an impact on process of developing products: interest level, task commitment, time commitment, and human and material resources. Of the seven subjects, Students A, D, E, and F found their initial interest in the project decreasing over time. Without this high interest level, the task commitment necessary for product completion was not available. Another factor, described by Students B, D, and G was related to the time commitment. Flexible scheduling was not in effect in several of the schools. Also, many of the students were responsible for completing all of their classroom work when they returned from the resource room. Finally, Students C and F commented on the problems they had obtaining appropriate human and/or material resources.

Summary of Interview and Questionnaire Data on Non-Completors

Four of the key features embedded in the interview and questionnaire forms have been identified by students, resource teachers, classroom teachers, and parents as the factors that have an impact on the students' decision not to complete an initiated project. More specifically, the key features were as follows: interest level, task commitment, time commitment, and human and material resources.

Summary

In the introductory sections, descriptive statistics on the predictor variables by group membership (i.e., "revolve in"/did not "revolve in") were portrayed. These preliminary data illustrated the minor differences between the two groups on the constructs of achievement, academic self-concept, locus of control for successes, and locus of control for failures. Then, the results of the study were presented for each of the three research questions.

In response to the quantitative research question, focusing on the possible correlates of creative production, it was found that academic self-concept and achievement were of limited value in Analysis A: Total Sample.

Taken together, these variables accounted for approximately 4% of the criterion variance. The impact of academic self-concept was slightly higher in Analysis C: Town 04 with 6% of the variance explained.

Relative to the first qualitative research question concerning factors that might explain why certain talent pool students did not "revolve in" to the resource room to work on a product, the Student Questionnaire data were analyzed across 10 towns, and within and across a subset of 4 towns. For purposes of these analyses, the questionnaire was divided into four sections. Information from the first section indicated that the percentage of students involved in Type I and Type II Activities varied considerably within towns and was somewhat stable across towns.

The second section of the questionnaire revealed that at least 30% of the time students participated in Type I Content Areas of Science and Social Studies across 10 towns. In some towns other subjects were added: Art (Town 01); and Language Arts, Music, and Drama (Town 04). The Type II Categories, discussed in the third section, in which students were involved frequently were Creative Thinking, Critical Thinking, and Mini-courses across 10 towns, and across 4 towns. For the within town analyses, Creative Thinking and Critical Thinking were popular in Towns 01, 04, and 09; and Mini-courses were the additional category in Towns 04, 07, and 09.

Finally, in the fourth section of the Student Questionnaire, two major factors emerged in the analyses across 10 towns, and across 4 towns as explanations for the lack of involvement with product development: difficulty in generating project ideas, and problem in allocating time for project work.

As to the results of qualitative research question 2, the interview and questionnaire data from students, resource teachers, classroom teachers, and parents were synthesized to determine if certain factors were associated with the non-completion of products. From a review of the trends and patterns in the data, four factors were identified: interest level; task commitment; time commitment; and human and materials resources.

DISCUSSION AND IMPLICATIONS

The purpose of this quantitative and qualitative investigation was threefold: (1) to determine whether intellective (e.g., achievement) and non-intellective (e.g., academic self-concept and locus of control) constructs were significantly related to creative production; (2) to identify factors that explain why certain talent pool students did not engage in creative production; and (3) to examine factors associated with the non-completion of a product. In this chapter, the findings related to each of these objectives will be reviewed and discussed. Then, the educational implications of the findings and the recommendations for future research efforts will be presented.

Discussion

Correlates of Creative Production. Although a considerable amount of research has been generated on the identification of and programming for gifted students, there have been only a few attempts directed at testing a systematic model (see Delisle, 1981; Delisle, Reis, & Gubbins, 1981; Reis, 1981) which addresses these two issues: Who are the gifted? What programming techniques are appropriate for these youngsters? These particular attempts have been associated with the implementation of the Revolving Door Identification Model (Renzulli, Reis, & Smith, 1981). For this current study on the installment of this model in several Connecticut towns in grades 4-6, the following quantitative research question was posed:

> To what extent and in what manner do achievement, academic self-concept, locus of control for successes, and locus of control for failures predict student involvement with product involvement.

As detailed earlier, step-wise multiple regression procedures were employed for analyses across and within specific towns in response to this question. In brief, the findings indicated that academic self-concept, as measured by the Self-Appraisal Inventory (Instructional Objectives Exchange, 1972) was the first significant predictor ($p < .01$), and achievement was the second significant predictor ($p < .05$) in Analysis A: Total Sample. It must be remembered, however, that only about 4% of the criterion variance was accounted for by this combination of predictors. For Analysis B: Across Each of the Four Towns, this same percentage of explained variance was attained with academic self-concept.

When the within town analyses are reviewed, a significant F-value for incremental validity was achieved in just one of the procedures, that of Analysis C: Town 04. In this analysis, academic self-concept, once again, became the significant predictor, explaining 6% of the variance in "revolve."

Overall, it can be said that the findings related to the quantitative research question were of negligible value in uncovering the correlates of creative production. Despite the statistical significance in Analyses A, B, and C (Town 04), this fact has very little impact on educational practices when there was such a large amount of unexplained variance (i.e., residual).

It should be recalled that the quantitative phase of the present study was a refinement of the research by Delisle (1981). However, the results of the two studies were not parallel. There were several reasons for this outcome. First, the data bases for the quantitative investigations were not exactly the same. Second, in the present study, achievement test scores, using Normal Curve Equivalents (NCEs), over 75 restricted the number of subjects. And third, the assignment procedure to the top 5% and the next 20% of the talent pool was not identical in each study because of the use of NCEs versus class rank (i.e., combination of achievement and intelligence test results - total battery or subtest scores).

A few final comments should be made about the quantitative investigation focusing on the correlates of creative production. It is apparent that

the limitations put forth by Isaac and Michael (1971) in describing the causal-comparative model were operative in this study. In review, there was a lack of control over the independent variables since it was a matter of searching through a data base for possible causal factors. Also, there was no way of predetermining if the causative factor was among the pre-selected variables. Finally, the interaction of several factors may have actually influenced a student's decision to become involved in creative production. And, of course, these factors could have been situation specific. That is, the phenomena that spurred students on to product development may have been non-existent in another situation.

Factors Explaining the Lack of Creative Production. The second objective of this study concerned the examination of this research question:

> Are there any factors that might explain why certain talent pool students did not "revolve in" to the resource room to complete a product?

The Student Questionnaire was constructed specifically for this qualitative research question. As detailed earlier, the final version of the questionnaire resulted from several phases of content validation. Then this form was used to collect data from 305 students who did not "revolve in" to the resource room to develop a product. Prior to specifying their reasons for this decision, preliminary questions dealt with curricular activities designed to encourage involvement in creative production. These activities were based on the objectives of the Enrichment Triad Model (1977); therefore, the degree to which students were involved in Type I: General Exploratory Activities and Type II: Group Activities was assessed. These analyses across 10 towns and across 4 towns showed that approximately 15% of this particular group of talent pool students had no experiences with Type I and Type II activities. Additional analyses within a subset of four towns indicated that this percentage varied considerably from a low of approximately 3% for Type I to a high of 41% for Type II Activities.

The next analyses of the Student Questionnaire centered on the selection of Type I Content Areas and Type II Categories, and the extent of student participation in these enrichment experiences. It appears that, in general, Type I Content Areas were limited to Science and Social Studies; however, within specific towns several additional topics were offered, including Art, Language Arts, Music, and Drama.

Although an array of Type II Activities is available from created or published materials, students experienced only Creative Thinking, Critical Thinking and Mini-courses with any substantial degree of frequency across 10 towns, and across 4 towns. For the within town analyses, the categories were Creative Thinking and Critical Thinking in Towns 01, 04, and 09; also, Mini-courses were added to these categories in Towns 04, 07, and 09.

In the last section of the questionnaire, two factors emerged in the analyses across 10 towns and across 4 towns as explanations for the lack of involvement in a Type III: Individual and Small Group Investigations of Real problems. The first factor was related to the difficulty in generating project ideas; and the second factor concerned time management if a project were pursued.

The findings from qualitative research question 1 actually provide data for a formative evaluation of the implementation of the Revolving Door Identification Model. As a result, specific programming modifications could be adopted, as will be mentioned in the next section on educational implications.

Factors Associated with Non-Completion. In an interactive model, such as Triad, student involvement with creative production is an objective. The student may pursue creative/productive activities at certain times, in certain areas of study, and under certain circumstances. This type of flexibility is one of the unique characteristics of RDIM. Most curricular modifications demand that students be involved in the program all year long. But in RDIM, giftedness is viewed as a topical and temporal set of behaviors which allows students to pursue projects when their interests are piqued. Sometimes, however, there is a curtailment of the specific activities; therefore, qualitative research question 2 was investigated:

> What factors, if any, are associated with the non-completion of a product?

Data from various target groups were collected via the Student Interview, Resource Teacher Interview, Classroom Teacher Interview, and Parent Questionnaire. This series of forms was subjected to several content validity checks before they were used with the seven talent pool students who initiated but did not complete products, and their teachers and parents. A review of the trends and patterns in the response data disclosed four factors that interfered with the process of product development: interest level; task commitment; time commitment; and human and material resources. All of these factors were embedded in the interview and questionnaire forms. And, through the process of synthesizing the data, they were evidenced. Apparently, the lack of one or more of these factors affects the continuation of product development.

Summary. The current study was undertaken to investigate whether the characteristics of achievement, academic self-concept, locus of control for successes, and locus of control for failures have an impact on a student's decision to become involved in creative production. In addition, there were attempts to determine the factors associated with the lack of product development, or product completion. Each of these research efforts resulted in several conclusions, some of which were quite surprising, and others which appear to be of value for future investigations.

The outcome of the multiple regression procedures were not anticipated because of prior investigations of the relationship between achievement and locus of control (Chance, 1965; Crandall, Katkovsky, & Crandall, 1965; Crandall, Katkovsky, & Preston, 1962; McGhee & Crandall, 1968; Rotter, 1966); academic self-concept and achievement (Colangelo & Pfleger, 1978; Malone & Moonan, 1975); academic self-concept and creative/productive behavior (i.e., revolve) (Delisle, 1981); and due to the theoretical connection of academic self-concept and locus of control (Whitmore, 1980). In this study, however, these relationships were, minimal: achievement and locus of control for successes (r = .044); achievement and locus of control for failures (r = .039); academic self-concept and achievement (r = .096); academic self-concept and creative productive behavior (i.e., revolve) (r = .177, $p < .01$); academic self-concept and locus of control for

successes (r = .330, $p < .01$); and academic self-concept and locus of control for failures (r = .029).

The findings of the quantitative phase of this study provoke further questions about the theoretical nature of creative/productive behavior. Perhaps achievement, or above average ability, is a necessary, but not sufficient characteristic of this behavior; however, the link is still unresolved in an empirical sense.

In contrast to the limited impact of the quantitative variables, the factors emanating from the questionnaire and interview data in the qualitative phase of this study prove to be quite interesting. Students who did not develop projects could not think of project ideas, or they could not find ways of reorganizing their time schedules. Those who were non-completors found it difficult to maintain their interest level, task commitment, and time commitment; in addition, they could not access the necessary resources. Each of these factors will be dealt with in the section on implications. Prior to elaborating on solutions for the factors, one commonality between the two groups of students who did not initiate or complete products should be noted: time management. This is definitely a concern for any programming model which is dependent on removing students from their classrooms.

Educational Implications

In the past, the metric for giftedness was restricted to test-taking, or lesson-learning abilities. These abilities represent an important type of giftedness in which students are high-achievers and consumers of information. However, there is another type of giftedness which is of equal importance, that of creative/productive behavior. Both types are accommodated within the implementation of the Revolving Door Identification Model because of the flexible identification and programming techniques. Students with above-average or high abilities are exposed to the Enrichment Triad Model, allowing them to engage in preliminary experiences in which they are mainly consumers of information, Type I: General Exploratory Activities and Type II: Group Training Activities. Also, some of these same students may pursue Type III: Individual and Small Group Investigations of Real Problems, resulting in the production of new information. With this background information in mind, the major factors of this study will be considered.

The factors from the current research on the implementation of the Revolving Door Identification Model lead to several recommendations for staff development. All of these implications result from the questionnaire and interview data which proved to be useful evaluative tools for testing a model in a real-world school environment. Each factor will be listed and followed by one or more recommendations:

Difficulty in Generating Project Ideas

1. Under the guidance of the resource teacher, groups of talent pool students should experience the types of activities outlined in the Enrichment Triad Model by working through a prototype (i.e., curricular unit based on Triad).

2. During sessions on creativity training, teachers should illustrate how interest-based questions or problems can be translated into Type III investigations.

3. Students should be exposed to Type III investigations through a product fair, or by occasionally "shadowing" a student working on a project.

4. Students should be encouraged to use "The Interest-A-Lyzer" (Renzulli, 1977) as a tool to identify their present and potential interests.

Problem in Allocating Time for Product Development

1. Students and teachers should be involved in sessions on curriculum compacting, a technique used to telescope the basic curriculum in order to allocate time for Type III investigations.

Interest Level

1. During the intake interview, several probing questions should be raised concerning the depth of a student's commitment to the project idea.

2. Preliminary work on a particular topic should begin in the classroom to determine the student's willingness to execute the project idea.

3. The resource teacher and student should meet periodically to review the progress of the project. At this time, any potential problems should be identified and resolved.

Task Commitment

1. This characteristic seems to be aligned with interest level. A series of questions directed at this factor should be a part of the intake interview.

Time Commitment

1. Curriculum compacting should be a part of the programming efforts, as mentioned earlier.

2. The student and resource teacher should complete the management plan, outlining the necessary tasks for product development.

Human and Material Resources

1. Mentorship programs should be established through a search of community talent.

2. Special arrangements should be made so students have access to a variety of resources when they are pursuing Type III investigations.

Recommendations for Further Research

Based on the findings of the current quantitative and qualitative investigation, the following recommendations for future research efforts are suggested:

1. A follow-up study should be conducted on the students who did not initiate, or complete products to determine the extent of their future involvement with creative production.

2. A comparative study of the products completed by students who "revolved in" to the resource room versus those developed in the classroom .

3. A comparative study of the products completed by students who "revolved in" to the resource room versus those developed in the classroom by students who did not "revolve in" to the resource room should be made to determine if there are distinct differences in product quality.

4. A study of talent pool students should be undertaken to examine the preferred learning styles of those who are creative and productive, non-productive, or non-completors.

5. A study should be designed to evaluate how the characteristics of above-average ability, creativity, and task commitment (i.e., Three-ring conception of giftedness) impact on a student's decision to become involved in a creative accomplishment.

6. The questionnaire and interview forms created specifically for this study should be part of the formative evaluation of the implementation of the Revolving Door Identification Model. These data, then, could be used to provide feedback and in-service sessions to students and teachers. Later, the implementation process could be re-evaluated to assess the impact of the information techniques.

References

Chance, J. E. Internal control of reinforcements and the school learning process. Paper presented at Society for Research in Child Development meeting, Minneapolis, March 1965.

Colangelo, N., & Pfleger, L. R. Academic self-concept of gifted high school students. Roeper Review, 1978, 1(1), 10-11.

Cox, C. M. The early mental traits of three hundred geniuses (Vol. II): Genetic studies of genius. Stanford, CA: Stanford University Press, 1926.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. Children's beliefs in their own control of reinforcement in intellectual-academic situations. Child Development, March 1965, 36(1), 91-109.

Crandall, V. J., Katkovsky, W., & Preston, A. Motivational and ability determinants of young children's intellectual achievement behaviors. Child Development, 1962, 33, 643-661.

Delisle, J. R. The revolving door model of identification and programming for the academically gifted: The correlates of creative production. Unpublished doctoral dissertation, The University of Connecticut, 1981.

Delisle, J. R., Reis, S. M., & Gubbins, E. J. The revolving door identification and programming model. Exceptional Children, October 1981, 48(2), 152-156.

Hollingworth, L. S. Children above 180 I.Q. Stanford-Binet. New York: World Book Company, 1942.

Instructional Objectives Exchange. Measures of self-concept K-12 (Rev. ed.). Los Angeles: Author, 1972.

Isaac, S., & Michael, W. B. Handbook in research and evaluation. San Diego, CA: Robert K. Knapp Publisher, 1971.

Malone, C. E., & Moonan, W. J. Behavioral identification of gifted children. Gifted Child Quarterly, 1975, 19, 301-306.

Marland, S. P. Education of the gifted and talented: Report to the Congress of the United States by the U. S. Commissioner of Education and background papers submitted to the U. S. Office of Education. Washington, D.C.: U. S. Government Printing Office, 1976.

McGhee, P. E., & Crandall, V. C. Beliefs in internal-external control of reinforcement and academic performance. Child Development, 1968, 39, 91-102.

Reis, S. M. An analysis of the productivity of gifted students participating in programs using the revolving door identification model. Unpublished doctoral dissertation, The University of Connecticut, 1981.

Renzulli, J. S. The enrichment triad model: A guide for developing defensible programs for the gifted and talented. Mansfield Center, CT: Creative Learning Press, 19771

Renzulli, J. S. What makes giftedness? Reexamining a definition. Phi Delta Kappan, November 1978, 60(3), 180-184; 261.

Renzulli, J. S., Reis, S. M., & Smith, L. H. The revolving door identification model. Mansfield Center, CT: Creative Learning Press, 1981.

Renzulli, J. S., Smith, L. H., White, A. J., Callahan, C. M., & Hartman, R. K. Scales for rating the behavioral characteristics of superior students. Wethersfield, CT: Creative Learning Press, 1976.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80(1, Whole No. 609).

Tallmadge, G. K., & Wood, C. T. User's guide: ESEA Title I - Evaluation and reporting system. Mountain View, CA: RMC Research Corporation, 1976.

Terman, L. M. Mental and physical traits of a thousand gifted children (Vol. I): Genetic studies of genius. Stanford, CA: Stanford University Press, 1925 & 1926.

Whitmore, J. R. Giftedness, conflict, and underachievement. Boston: Allyn & Bacon, 1980.

Witty, P. A. Who are the gifted? In N. B. Henry (Ed.), Fifty-seventh Yearbook of the National Society for the Study of Education, Part II. Chicago: The University of Chicago Press, 1958.

THE INCREMENTAL VALIDITY OF A TEACHER RATING SCALE IN IDENTIFYING CREATIVELY PRODUCTIVE STUDENTS

Robert Jay Kirschenbaum

The University of Connecticut

Abstract

A teacher rating scale of creativity, the Creative Process Inventory (CPI), was constructed for this study. It is based on a new approach for categorizing dimensions of creative activity. The four dimensional subscales of the CPI proved to be internally consistent and stable in a pilot study. It was theorized that the subscales would effectively identify students who developed project ideas and completed products in a gifted program.

Seven null hypotheses concerning the relationship of the CPI to independent and dependent variables were tested in two school districts in Connecticut that employed the "revolving door" approach to gifted education (Renzulli, Reis, & Smith, 1981). Subjects in this study were students placed in "talent pools" because of high scores on standardized tests or recommendations from teachers or parents. These students, who comprised about 30% of the school district populations for grades 3-6, were rated by their regular classroom teachers on the CPI. Talent pool students who developed project ideas as a result of enrichment activities were eligible for supplemental services that guided them in work on a product designed to solve a "real" problem. In one school district, these products were rated by two teachers of the gifted using the Student Product Assessment Form (SPAF; Reis, 1981).

A significant interaction was found between sex and achievement test percentile scores on the CPI. Girls who scored higher on achievement were rated higher on the CPI, but boys showed no such relationship. CPI ratings were also related to grade level; students at each grade level were rated higher and with greater certainty on each subscale until grade six. Sixth graders had significantly lower mean ratings than all other grades in 9 out of 12 comparisons.

The primary null hypothesis was that the CPI subscale scores would not provide substantial incremental validity to the established identification measures in discriminating among talent pool students who had a project idea and completed a Type III product or did not. This hypothesis was rejected following results from a stepwise discriminant function analysis that forced in CPI subscales after intelligence and achievement test scores. The CPI subscales were the only significant variables to emerge. The CPI classified students in their correct group with 82% accuracy and explained 45% of the variance between the groups.

A null hypothesis that the CPI would be unrelated to SPAF and GIFT (Rimm, 1980), a self-report of preferences associated with creativity in art and writing, was accepted. The CPI was also unrelated to a standardized measure of intelligence.

INTRODUCTION

A great deal of money, time, and effort is presently being devoted in the United States and other countries to locate gifted and talented youngsters for special training in what are commonly called "gifted programs". Given the competitive nature of American society, placement in a gifted program is highly prestigious and much sought after by many parents for their children. But, educational resources are limited. Care must be taken that only those who merit supplemental services for the gifted and talented receive such services. The problem is to make sure no one who needs these services be left out without incurring the great additional expense in time and money of extensive testing. Yet, the problem of including students who can not take full advantage of special learning opportunities for gifted and talented but are falsely identified must also be addressed.

The Revolving Door Identification Model (RDIM) was developed by Renzulli, Reis, and Smith (1981) as an approach to selecting superior students for supplementary educational services. Renzulli's (1978) conception of giftedness and related definition and his guide for developing a differentiated curriculum for gifted students (1977) are the two main components of this approach.

RDIM is an extension of Renzulli's (1977) curriculum model, called The Enrichment Triad Model. The purpose of Triad is to provide enrichment activities that turn the interests of gifted and talented students into productive action. Children identified for the program are required to formulate a real life problem in an area of their own interest, and then act as a novice professional would in solving it. Renzulli's (1978) three-ring conception of giftedness defines those students as gifted who exhibit behavior subsumed under three clusters of traits called Above Average Ability, Creativity, and Task Commitment. The main objectives of the RDIM approach is to identify children with these three clusters of traits and offer them individualized training and guidance to facilitate their creative productivity. The greatest difficulty lies in finding students who possess those characteristics and abilities that fall within the cluster called Creativity. Academic test measures simply do not help in this search.

The current practice in many school districts taking the RDIM approach is to use available tests of achievement or intelligence, and grades, to collect a pool of students who are in the top 15-25% of their class. Teachers and parents are then requested to add the names of any students who might be gifted or talented but slipped through this first screening net. Enrichment activities are given to these students in groups and those with project ideas are identified for guidance in formulating a real problem for creative solution.

While this identification procedure is very flexible, what information does it provide about creative abilities? When a student suggests a project, the TAG teacher can only rely on informal comments from teachers and personal observations for information about the student's abilities. What is needed is a descriptive profile of a child's creative strengths

and weaknesses that could help the teacher of the gifted and talented to do individualized educational planning.

Creativity is not a single, unitary quality of a person, but a complex phenomenon encompassing certain types of motivational and emotional states, cognitive processes, attitudinal dispositions, and so on (Guilford, 1971; MacKinnon, 1978). The assessment of creative ability is problematical (Treffinger & Poggio, 1972); there is still concern about what administrative and scoring procedures are most appropriate for getting a true measure of creative ability (Treffinger, Torrance & Ball, 1980). The Creative Process Inventory (CPI) is a teacher rating scale of students' creativity constructed for this study. It is based on an exhaustive review of the literature describing cognitive processes associated with and personality correlates of creativity. From this research, four dimensions of creative ability were identified. Seven items were constructed by which a teacher could rate a student's ability in each dimension.

At present, teacher recommendations used in RDIM districts are generally valued as a source of identification information, even though teachers are only required to make a rough estimate of giftedness and talent. Few teacher rating forms have any solid theoretical or empirical support and do not produce diagnostic information of value in curriculum programming. It was theorized that the CPI subscales, each tapping one of four dimensions of creative ability, could differentiate among students who have or have not come up with a special project idea which they then successfully carried out. No doubt, knowing this ahead of time would allow the gifted program to more efficiently allocate services.

Objectives of Research

The purpose of education for the gifted and talented is to aid students with superior learning, motivational, and expressive abilities in the development of skills and habits necessary for creative productivity (Kirschenbaum, 1980). It is within the sources of the public schools to help gifted and talented students focus their interests and energies on projects that can have a beneficial impact on their personal growth, their peers, family, or a larger segment of society. Gifted education is only useful to the extent that those students identified as gifted will be able to learn strategies and develop abilities that can be applied toward creative production. To date, no empirical study has been conducted to determine if the identification procedures used by schools with gifted programs based on the Triad model effectively locate students most likely to become creative producers in a gifted program.

The value of teacher rating scales as part of the identification process is also open to doubt. Several questions may be raised concerning the use of teacher rating scales in the identification of highly creative children. Are structured teachers' ratings of creative ability predictive of product outcomes? Are students who are rated poorly less likely to finish products? Can teachers rate creative ability without being unduly influenced by their knowledge of student grades and test scores? can certain types of creative students be distinguished using teacher ratings? Do teacher ratings relate to students' self-reported preferences that have

previously been associated with creativity? Finally, what combination of measures are most predictive of students' creative production in a gifted program?

The specific objectives of this research were:

1. To develop a rating scale with four internally consistent subscales measuring four dimensions of creativity.

2. To investigate the intercorrelation among the various identification measures and CPI scores.

3. To determine which measures, singly or in combination, are most strongly related to product rating criteria.

4. To examine the profiles of subscale scores for students with Type III products in particular content areas for characteristic differences.

Research Procedure

The research objectives presented above can be restated as the following null hypothesis:

1. The CPI subscale totals will not correlate significantly with standardized achievement or intelligence scores, nor with a self-report of preferred activities related to creativity.

2. CPI subscale scores will not discriminate between students completing a creative product or not.

3. Subscale totals will not discriminate among students' interest areas inferred from their products.

4. Subscale totals will not correlate significantly with the product assessment summary items (A reanalysis of the data collected by Reis (1981) on SPAF is discussed in "A Case for the Broadened Conception of Giftedness", Phi Delta Kappan, May 1982).

5. The rating scale total will not provide incremental validity for the identification procedure as a whole that is currently used in each of the school districts involved in the study.

6. A factor analysis of the CPI will not reveal four distinct factors corresponding to the theorized dimensions underlying the CPI.

7. There will be no significant relationships between age, sex, school district or grade level groupings and ratings on the CPI.

The Group Inventory for Finding Creative Talent (GIFT) (Rimm & Davis, 1976; 1980) will be used as a measure of self-reported preferences whose relationship to creativity has been extensively researched. The Student Product Assessment Form (SPAF) (Reis, 1981) is a measure of product quality that is used in school districts employing RDIM and has been the subject of recent research aimed at checking its reliability and validity.

This study was carried out in two broad phases of (1) instrument construction, and (2) field research. An outline of these phases is offered below for the sake of clarity and brevity:

Phase 1: Instrument Construction

1. Write operational definitions for constructs.
2. Construct 25 items for each creativity dimension.
3. Assemble 100 items with dimension definitions.
4. Have doctoral seminar group classify items by dimensions while indicating their degree of certainty about their classification.
5. Calculate the frequency of agreement and degree of certainty for each item.
6. Discard highly ambiguous items and include in new list with clarified construct definitions.
7. Have doctoral and masters seminar group classify items by dimensions while indicating their degree of certainty about their classification.
8. Calculate the frequency of agreement and degree of certainty for each item.
9. Select items with 75% agreement or better on highly certain classifications and randomly compile into a new list.
10. Send out new list of items to 50 of the foremost experts in the field of creativity for classification of items and indication of the items most relevant to the domain of creativity.
11. Collect responses and calculate percent agreement, chosing the best items for inclusion on the CPI.
12. Conduct a pilot study on the CPI in order to calculate the alpha internal consistency and retest reliability of each dimension subscale and the stability of each item.
13. Using the most reliable individual items, write the final version of CPI with seven items per scale.

Phase 2: Field Research

1. Have TAG teachers administer GIFT to talent pool students in two school districts taking part in RDIM research.

2. Distribute copies of CPI's to the regular classroom teachers of students who have taken the GIFT.

3. Collect available achievement test score data on those students in the study.

4. Once CPI scores are collected, test for their relationship to achievement test scores using the Pearson correlation coefficient (see null hypothesis #1).

5. Factor analyze CPI results. This will reveal if empirical factors match theoretical distinctions upon which the subscales are based (see null hypothesis #6).

6. Run t-tests on CPI results by sex and school district and analysis by variance by grade. The relationship between age and the CPI will be examined through use of the Pearson correlation coefficient (see null hypothesis #7).

7. Collect completed Student Product Assessment Forms at the end of the school year.

8. Perform discriminant function analyses with independent variables, i.e., achievement test scores, GIFT scores, sex, age, teacher, special teacher nomination, to determine if they can predict who was revolved into the resource room. Check results for effect of CPI total and subscale scores on the established identification procedure by making them the last discriminant variables on alternate analyses (see null hypothesis #5).

9. Regress SPAF total scores on criteria used by the school districts as part of their identification procedure, forcing them in first, then adding CPI subscale scores, to determine if CPI adds significantly to the variance already explained (see null hypotheses #4 and #5).

10. Perform discriminant function analyses with CPI subscales to determine if they can predict subject areas of the student products (see null hypothesis #3).

The Creative Process Inventory

Creative activity is constrained by blocks to its development and expression (Adams, 1974; Alamshah, 1972; Crutchfield, 1973; Krippner, 1967; Parnes, 1963). Blocks restrict freedom of movement and thought. They prevent an individual from thinking effectively or at all about a particular subject or method of solving a problem because of cultural taboos or

personal inhibitions, or both. People are also blocked by a simple lack of competency in skills necessary for effective action. In this study, individuals were rated on small variations in activity within each of several dimensions of creative ability. What was sought was a profile of creative behavior that could give some information about creative weaknesses as a possible sign of blocks, and creative strengths.

The construct definitions formulated for this study have as their basis a transactional conception of creativity (Golann, 1963; Taylor, 1972, 1976). Within this framework, creativity is defined as activity directed at establishing an organization of self and environment (Ghiselin, 1952; Gutman, 1967; Mooney, 1962) that maximizes the ability of the person to experience and shape the environment to his/her will (Maslow, 1972; Parnes, 1977; Rogers, 1962) with constructive and novel results (Parnes, Noller & Biondi, 1977).

The concept of product novelty, is an integral part of most definitions of creativity (Gilchrist, 1972; Jackson & Messick, 1965; Kagan, 1967; Parnes, 1972, 1975; Stein, 1974; Wilson, 1958), but Thurstone (1952) states that whether society considers a product to be uniquely valuable is not a prerequisite for the assessment of something as creative. "The act is creative if the thinker reaches the solution in a sudden closure which necessarily implies some novelty for him" (p. 22). However, if a product is recognized by a group of people at some point in time as being original and useful, it is generally assumed that the person had made a concerted effort to transform the environment in a creative way (Adams, 1974; Kubie, 1958; Rothbart, 1972; Stein, 1974; Wallach & Wing, 1969).

We may consider young children to be generally operating at an "immature" level of creativity (MacKinnon, 1978). The types of creative activities they would be engaging in are: (1) spreading out their attention to many aspects of the environment; (2) generating many ideas and questions about the environment, and also its relationship to themselves; (3) spending a lot of time with certain materials, organizing and collecting them, developing an intimate knowledge of them; and (4) playfully imagining desired scenarios that are transformations of reality. The degree to which each of these four types of activities are adroitly coordinated determines a student's level of creative preparedness.

The CPI was built upon the assumption that items reflecting activity in this lower or "immature" phase of creative activity is most appropriate for children in grades 3-6. What distinguishes the two phases is the degree to which creative activity is consciously directed towards a creative product that will have an intentional impact on society. Children will tend to spend a disproportionate amount of time in the first phase of the creative experience, preoccupied with developing the skills and working knowledge required before the creative product can even begin to be conceptualized in its final form. The mature creative adult will have developed strategies that serve to streamline the process in the first phase, having a wealth of information and experience already at his or her fingertips. Andrews (1975) describes "input" and "output" phases of the creative process that is similar to the above conceptualization. He says that in the input phase, creative abilities are being developed, and in the output phase, creative production is of uppermost importance to the individual.

The four types of behavior at the lower, or "immature", level of creativity are operationally defined as follows:

1. Contact behavior is active attention to and exploration of the physical environment. It is indicated by the amount and accuracy of reported details and attraction to diverse aspects of the environment. Some examples of contact activity noted in the literature are curiosity (Day, 1968), preference for unusual content (Barron, 1969), and openness to experience (Rogers, 1962).

2. Consciousness behavior is insightful comprehension of interrelationships and contradictions among ideas or physical patterns. It is indicated by the amount and relevance of ideas and questions. Some examples of consciousness activity noted in the literature are constructive criticism (Rossman, 1931), ideational fluency Wallach, 1970), and nonconformity of judgement (Barron, 1961).

3. Interest behavior is continuous involvement in a field of inquiry or artistic media requiring adept use of necessary methodology and equipment. It is indicated by the amount of time and effort spent on independent projects and on the development of mastery. Some examples of interest activity noted in the literature are task commitment (Maddi, 1965), perseverance (MacKinnon, 1978), and self-sufficiency (Cashdon & Welsh, 1966).

4. Fantasy behavior is imaginative transforming or modifying of past experience or present reality with coherent results. It is indicated by the amount and meaningfulness of images or artistic interpretations. Some examples of fantasy activity noted in the literature are daydreaming (Schachtel, 1976), humor (Torrance, 1962), and novelty of story telling (Pearson & Maddi, 1966).

Consistent output of unique and highly effective products requires an individual to be working at a high level of creative preparedness, just as reading readiness is a prerequisite to fluent reading. Action at this higher, "mature" level of creativity is dependent on the interaction of these four types of activities under a conscious and purposeful approach to production, such that a new, higher phase of experiencing takes place.

At the lower level, creative abilities manifest in the four types of activities may be alternately obscured by a lack of focus, careless errors, poor organization, or an unwillingness to make revisions. Educational planning that sets out to eliminate these poor work habits and deficiencies will have as its outcome creative production of good quality. If these blocks are left standing, the quality or creative power of products will suffer. The CPI is an initial effort to assess students' strengths and weaknesses in the area of creativity that may eventually be helpful in diagnosing particular types of blocks to creative power.

Creativity Classification System

The rationale for the Creative Process Inventory is that creativity can be described as activity occurring alternately in one of nine dimensions quite similar to the stages enumerated by Rossman (1931). The term "dimension" is chosen over "stages" to avoid the implication that one dimension must logically follow another in an invariant sequence. The dimensions describe activities that operate under the constraints of different psychological functions and environmental conditions. Descriptors from published research on the creative experience have been compiled and categorized into each of the nine dimensions of what is called the Creativity Classification System (CCS). Behavioral characteristics associated with the first four dimensions of the CCS have been agreed upon by both regular classroom teachers and experts in the field of creativity.

Activity in the dimensions of the CCS are "indeterminent" (cf. Rothenberg & Hausman, 1976), in that their occurrence can not be predicted, but are "determinent" of creative productivity. Each dimension exists as a local system whose function is defined partly in relation to the entire process. Just as reading is a process by which information is simultaneously perceived in figural form by the senses and cognized in meaningful, symbolic form by the mind, the CCS describes a process by which information is processed in order to meet current needs while being acted upon and stored in a manner that is characterized as creative in retrospect.

Wallach & Kogan (1965) have reviewed the research on creativity and raise questions concerning the dimensionality of abilities placed under the general rubric of creativity. They comment on the necessity for developing a conceptual framework on which to base measurement procedures; what many researchers say they are studying under the heading of creativity encompasses a range of behaviors and traits.

Elsewhere a description of how the creative person goes through each of the nine dimensions of experience has been given (Kirschenbaum, 1979):

Making Contact - by tapping the awareness continuum of internal and external sensations without rejecting anything outright by neither wanting nor ignoring perception that comes naturally;

Becoming Conscious - by searching in a smooth, strategic manner for those aspects of the environment that can be assimilated into structures of past experience, that is, searching for meaning while not looking for a right answer;

Channeling Interest - by identifying with a human field of endeavor, finding out the possibilities for personal growth within this field while maintaining a steadfast belief in the attitude that those who give of themselves shall receive;

Fantasizing - about a range of possibilities for self-enhancement, identifying alternative paths within the field of endeavor by seeing obstacles and rewards inherent in the long climb to self-fulfillment, not giving in to self-doubt;

Incubating - ideas and direct experiencing of a field of endeavor by putting aside responsibilities and problems within that field and striking out to replenish one's store of impressions of the rest of the world while taking "time out";

Establishing Creative Contact - by giving up one's preconceptions and identifying completely with an object/idea and "knowing" what must be done or said even if the reason is unclear, developing total empathetic contact with a solution;

Becoming Inspired - by the knowledge that one's situation is futile and intractible, yet open to a glorious range of possibilities for self-fulfillment if the situation can be manipulated in one's favor if one times personal action to the beat of personal aspirations and desire.

Producing - a form that reflects the intricacies of one's own aspirations, ideas, feelings, acting out of a sense of urgency and excitement while cultivating an egocentric assurance in the need for self-direction;

Verifying - the results of one's efforts by displaying the creative project for others to react to; testing the product to detect inadequacies; reexperiencing the consequences of one's new ideas and assumption that a need for destruction and renewel existed by seeking to understand the positive and negative ramifications of one's own efforts, and putting this understanding, in a moment of quiet, back into the awareness continuum (p. 2).

The CPI was built using the first four dimensions of the CCS which represents a lower phase of creative activity. What distinguishes the two phases is the degree to which creative activity is consciously directed towards a creative product that will have an intentional impact on society. A creative product is the result of activity in all the dimensions. Stein (1974) discounts Wallas's first stage of Preparation, which is somewhat analagous to the first phase of the CCS, as part of the creative process, but Ghiselin disagrees (1952) strongly,

> A great deal of the work necessary to equip and activate the mind for the spontaneous part of invention must be done consciously and with an effort of will. Mastering accumulated knowledge, gathering new facts, observing, exploring, experimenting, developing technique and skill, sensibility, and discrimination, are all more or less conscious and voluntary activities....Creative workers reporting their processes of production often inadvertently conceal the amount of conscious and voluntary work by their failure to stress it or to consider it in much detail. (p. 17).

Items of the Creative Process Inventory

Each of the items in the CPI were derived, either directly or indirectly, from published reports of characteristics of creative children and adults. Following are a list of the items with references to the studies that support the general content of each item. The items are grouped by dimensional categories and are not in the order in which they appear on the CPI.

Contact Dimension:

1. Accurately reports many details of the physical environment (Gough, 1961; MacKinnon, 1978; McKim, 1972; Rossman, 1931).

2. Notices details that others miss (MacKinnon, 1978, McKim, 1972; Gough, 1961, Rossman, 1931).

3. Very active in exploring places and doing new things (Cashdon & Welsh, 1966; Golann, 1962; Torrance, 1962).

4. Physically gets into things, manipulating or taking objects apart, in order to examine them closely (Dansky & Silverman, Getzels & Csikszentimihalyi, 1975; Torrance, 1963).

5. Fascinated by many physical aspects of the environment (Davis, Peterson, & Farley, 1974; Karlins, 1968; Lowenfeld, 1962; Ward, 1969).

6. Full curiosity, showing little hesitancy in exploring strange objects or unfamiliar situations (Day & Langevin, 1969; Maddi, 1965; Torrance, 1969).

7. Displays a great deal of curiosity about new things (Day & Langevin, 1969; Maddi, 1965; Torrance, 1969).

Consciousness Dimension:

1. Aware of the underlying complexities of life and human nature (Barron, 1968; Maddi, 1975; MacKinnon, 1978).

2. Understands subtleties that escape others and is insightful into the meaning of events (Barron, 1968; Maddi, 1975; MacKinnon, 1978).

3. Skeptical answers based mainly on authority or tradition (Martinson, 1974; Torrance, 1962; Ward, 1962).

4. Has many ideas and questions in one or more areas (Crutchfield, 1972; Karlins, 1968; Wallach, 1970).

5. Challenges the majority point of view, often playing the role of "devil's advocate" (Martinson, 1974; Torrance, 1962).

6. Likes to discuss complex phenomena, enjoying intellectual

stimulation and the free exchange of ideas (Barron, 1969; Gough, 1964; MacKinnon, 1978).

7. Synthesizes disparate elements or opposing points of view, using the strengths of each (Gordon, 1961; Koestler, 1964; Mednick, 1962; Torrance, 1979a).

Interest Dimension:

1. Repeatedly returns to a difficult, challenging situation despite initial frustrating experiences (Barron, 1969; Maddi, 1965; Patrick, 1955).

2. Shows a high frustration tolerance, undeterred by mistakes and other problems, but instead intensifies effort (Barron, 1969; Maddi, 1965; Patrick, 1955).

3. Overcomes obstacles and difficulties in working on an assignment or project through persistence (Barron, 1969; MacKinnon, 1978; Roe, 1952).

4. Tireless worker, always involved with some project, and is anxious about wasting time (Barron, 1969; Patrick, 1955; Roe, 1952; Torrance, 1962).

5. Stays committed to a personal project once involved in it and works hard, refusing to admit failure (MacKinnon, 1978; Taylor & Ellison, 1967; Torrance, 1962).

6. Takes the initiative for starting projects or completing necessary aspects of a group project, sometimes doing this unobtrusively (Barron, 1969; Cattell & Drevdahl, 1955; Helson & Crutchfield, 1970; Taylor & Ellison, 1967).

7. Spends a lot of time working independently on self-assigned projects (Cashdon & Welsh, 1966; MacKinnon, 1978; Roe, 1952).

Fantasy Dimension:

1. Shows signs of a powerful imagination, even if normally shy and quiet (Getzels & Jackson, 1962; Torrance, 1963; 1979).

2. Enjoys modifying or transforming the form of objects, situations, or images. (Getzels & Jackson, 1962; Osborn, 1963; Torrance, 1979).

3. Imbues animals or inanimate objects with human feelings, thoughts, and a life of their own (Gordon, 1961; Torrance, 1963).

4. Relates long stories about imaginary characters, events, or societies upon request (Lieberman, 1977; Singer, 1968, Torrance, 1963).

5. Great storyteller, embellishing freely on the truth for the

sake of entertainment (Lieberman, 1977; Singer, 1968, Torrance, 1963).

6. Has a playful way of doing things that involves use of humor or make-believe (Getzels & Jackson, 1962; Torrance, 1962; 1963).

7. Uses personification easily in speech, giving human properties to objects (Gordon, 1961; Torrance, 1963).

The CPI items are based on the findings of correlational studies of the characteristics of creative adults, adolescents and children. There is some question as to whether the characteristics of highly creative children are congruent with the characteristics of creative adults (Cacha, 1976; Parloff, Datta, Klemen, & Handlon, 1968). While behavioral traits selected for the CPI were cited in several reports, there may also be a problem in combining the results of research on young children who score well on tests of divergent production, older children who have either had products rated as highly creative or have themselves done well on divergent production tests, and adults rated the most creative in their field. Using characteristics drawn from correlational studies for constructing a predictive measure may also not be valid because characteristics that are found in a present study may have evolved from other traits rather than being present all along.

METHODS AND PROCEDURES

Torrance (1964) states that attempts to establish the validity of creativity measures have involved at least one of the following approaches:

1. Identifying high or low groups on some test measure and then determining whether or not they can be differentiated in terms of behavior that can be regarded as creative;

2. Identifying criterion groups on some behavior regarded as creative and then determining whether or not they can differentiated by appropriate test scores (p. 86).

The first approach was utilized for this study. The CPI was intended for use as an independent variable to predict creative productivity as rated on the SPAF. GIFT was administered to help establish criterion-related validity of the CPI, while achievement and intelligence test measures were expected sources of divergent validity.

The procedure used in this study was outlined in Chapter I. Reliability and validity information available for the published tests used in this study are included in Appendix B. Results for the test construction phase of the procedure will be included here rather than in Chapter IV, which will be devoted to the results of the field study phase of this study.

Research Design

The research undertaken in this study can be classified as ex post facto research (Kerlinger, 1973). This term applies to empirical inquiries in which the independent variables are inherently not manipulatable and relationships among variables have to be inferred without direct intervention in a controlled setting. Subjects were not assigned to treatments randomly but were instead studied in groups formed through the process of self-selection. Subjects were therefore intact groups that possessed talent pool characteristics that are related to the variables of the research problem.

Kerlinger (1973) states that educational research is often ex post facto because administrative policies that dictate class groupings and curriculum programming most often can not be influenced by investigators with research questions. Such studies therefore have much practical significance but are often difficult to interpret because they lack control. Many explanations of results may be plausible besides the theoretical explanations underlying the investigation, so internal validity is weakened.

Content Validation of the Creative Process Inventory

The Items of the Creative Process Inventory

The Creativity Classification System had been formulated some time before this study was conceived. It was decided that a rating scale of children's creative ability would be the method by which the theory underlying the CCS would be tested. The first objective became the writing of items for each of the first four dimensions. For this purpose, the relevant literature was perused closely for descriptors associated with creative ability and performance.

From the list of collected descriptors, 25 items were written that applied to abilities in each dimension. Thirteen doctoral students in the Teaching The Talented Program at the University of Connecticut at Storrs were asked to categorize each item into the correct dimension. They were also asked to indicate the certainty with which they categorized each item into a single dimension by marking each item with a negative sign (low certainty - guessing), positive sign (high certainty - certain), or a zero (moderate certainty - unsure). Many of the student raters in this phase had some familiarity with the CCS, and all had either taught or attended graduate creativity courses or workshops. In addition, each rater was provided construct definitions of each dimension that included (1) a definitional statement, (2) examples of observable behaviors in the dimension, and (3) general personality characteristics and habits associated with the dimension.

For each of the 100 items, the frequency with which each item was placed in a dimension and the mean certainty of those categorizations was calculated. All the items were marked as showing high agreement or high disagreement, with certainty being used as a plus or minus factor. Greater than 75% agreement among the raters that

an item belonged in a certain dimension was considered high. These items were retained for use in the next version of the scale, but not all items showing moderate agreement were discarded. It was necessary to retain some items in the Contact and Consciousness Dimensions that showed only modest agreement in order to maintain enough items in these dimensions to put into the next version.

Sixty-four items remained to be included in the next version of the scale. These were given, along with the construct definitions, to the entire membership of the Teaching The Talented Program, which included the doctoral students already mentioned as well as first year masters students. The same process was used to calculate percentage agreement on these items as was used with the original 100 items. Seventeen raters categorized the items, indicated their certainty, and returned the scales. Forty-one items were retained at this stage, randomly mixed and reassembled into a new version of the scale.

Fifty experts in the field of creative education were next contacted by mail to perform the same function as had been done by graduate students. The experts sampled included editors of journals, authors of books and articles, and consultants in the field of gifted and creative education. A cover letter, construct definitions, and the new version of the scale were sent to each expert along with a self-addressed envelope. After the number of scales returned dwindled after about two weeks, a second wave of mailings was sent out with a different cover letter asking the experts for their assistance. (The return envelopes were numbered to keep track of who had not yet returned the scale.) Thirty-five experts eventually returned the completed scale, one declined to participate, and the letter to one person was returned because of an incorrect address. Thirty-two items showed better than 75% agreement. These items were again randomly mixed and reassembled into a new scale.

Reliability Estimates of Early CPI Version

A pilot study was conducted to determine the reliability of the current version of the creativity rating scale. With the help of a masters student in the Teaching The Talented Program, fifteen teachers in grades 3-6 of Harwinton, Connecticut (population 4889, 1980 Census), were asked to participate in the study. Once they agreed, they were each sent rating scales, instructions and a cover letter informing them that they would be paid $5.00 for their cooperation.

The rating scale was called the Work Types Inventory to avoid possible halo effects surrounding the use of the word "creativity". The response format chosen for the items was a Likert-type scale with a range of 11 points (0-10). The instructions explicitly asked raters to avoid giving all high or low ratings based on a general appraisal of a student's academic ability in order to minimize the types of systematic errors mentioned earlier (i.e., leniency, severity and halo effects).

Four items were added to the thirty-two taken from the immediately preceding version of the scale. Added on at the end of the scale, these items were shortened versions of the construct definitions for each dimension. They were intended to serve as anchor items that best represented the behavioral trait underlying each dimension. A final item was added to assess the certainty of the ratings on the thirty-six previous items, and a final comment thanked the rater for her assistance and elicited critical remarks on any aspect of the rating scale, e.g., format, wording, etc. From the fifteen class lists, six students, three boys and 3 girls, were randomly picked separately from their respective gender groups. Ten of the fifteen completed and returned the scales on sixty students.

A measure of internal consistency, Cronbach's alpha, was calculated for each dimensional subscale on sixty subjects, split evenly between the sexes, in grades 3 (n=6), 4 (n=24), 5 (n=6), and 6 (n=24). The most recent update of the Statistical Package for the Social Sciences (SPSS) (Hull & Nie, 1981) was used for this and all other statistical analyses performed in this study. The Contact Dimension subscale, which consisted of eight items, had an alpha of .938. The Consciousness Dimension subscale had nine items and an alpha of .925. The Interest Dimension subscale had ten items and an alpha of .964. The Fantasy Dimension subscale had nine items and an alpha of .860. The reliability procedure of SPSS also produces a correlation matrix and alphas of each subscale if an item is deleted. This information proved valuable in making discussions about which items could be deleted to make the final scale as short as possible while maintaining high reliability.

Three teachers agreed to rate the same eighteen children they had rated about a month earlier and were each paid $5.00 extra. Pearson correlation coefficients were computed for each subscale and the total scale on 18 subjects to determine retest reliability. The coefficients were .918 (Contact Dimension), .849 (Consciousness Dimension), .843 (Interest Dimension), .657 (Fantasy Dimension), and .866 (Scale Total). All Coefficients were significant beyond the .001 level except the Fantasy Dimension subscale, which was significant beyond the .01 level.

With the internal consistency estimates so high, there was no need to consider adding items; instead, items could be deleted. Indeed, when items were deleted to come up with seven items in each subscale, internal consistency estimates rose since items that correlated least with subscale totals were dropped. The high retest coefficients indicated that the raters were adopting a generally stable mind set in rating subjects on items within each scale. Reliability estimates were recalculated on just those items included in the final version of the CPI. Alphas rose to .943, .926, .963, .900 for the first four dimensional subscales in order. Retest correlation coefficients were .909, .842, .858, and .750 for the four subscales and .878 for the Total Scale.

The retest coefficients for each item were examined to help determine which items should be deleted from each subscale. Items with nonsignificant correlation coefficients were generally deleted, except in the Fantasy Dimension subscale. In this subscale, fewer than seven

items would have remained, which was the number of items arbitrarily decided upon for each subscale. Comments by the raters most often referred to items in the Fantasy Dimension, so an effort was made to reword the poorest items in response to specific criticisms. Several items in the other scales were also modified to remove any possible ambiguity and make them as smooth as possible to read. Alpha internal consistency estimates were recomputed for the new 7-item subscales and found to be higher than for the original subscales having more items.

Validation of the Creative Process Inventory

Subjects and Procedure

Subjects were drawn from the talent pool populations in Ellington and Watertown, Connecticut. Ellington is a smaller school district (population 9711, 1980 Census) than Watertown (population 19,489, 1980 census). Ellington was originally a small dairy farming community that has evolved into a suburban "bedroom" community for professionals and commuters to Hartford. Watertown is a large town that is more industrialized but is close enough to Hartford to be considered a suburban community. The two school districts are taking part in field testing the RDIM approach along with ten other districts. This is the second year of the project.

The two towns were selected as sites for the present research because it was felt that the coordinators of gifted education in each town would be cooperative. A power analysis determined that the combined talent pool populations in the two towns would provide more than enough subjects to optimize the likelihood that statistical significance could be attained in the present study. Including a small and large school district in this study seemed desirable because research has shown that school size can affect the pattern of relationships of variables to creativity outcomes (cf. Kogan & Pankove, 1972).

Letters were sent via the two coordinators of gifted programs to all the TAG teachers in Ellington and Watertown informing them of the plan to conduct the present study. Included in the package containing the letters were copies of GIFT for every student in the talent pools from grades 3-6 and copies of the instructions used in administering GIFT. The coordinators were also phoned to ensure their assistance in collecting data and to answer any questions. Soon after they submitted archival data on identification information for each student in the talent pools in each district. Some gaps existed in this information and resulted in missing data.

Most GIFTS were administered by the TAG teachers in the month of March. No effort was made to control for the time or setting of the administration. A problem arose when about three dozen GIFT forms were damaged in the mails and new forms had to be ordered from Wisconsin. The result was that students at Polk Elementary School in Watertown were administered the GIFTs in May and the fifth grade talent pool groups in Polk (n=19) and Griffin Elementary Schools

(n=13) were never given the GIFT at all. In early May the final version of the CPI was finished and sent to the coordinators of gifted programs in the two school districts with instructions.

The number of students from Ellington in the talent pool who were included in this study is given in Table 3-1 below, broken down by grade and sex. The total number of students in each grade for the district is also shown. A total of 145 students were in the talent pool in Ellington, which was 31.9% of the total population. However, the CPI was completed on only sixty subjects. This was mainly because one regular classroom teacher was sick and was unable to do the paperwork, and another teacher refused to participate; together these two teachers accounted for most of the missing data.

Table 3-1. Frequencies and Percentages of Subjects in Ellington by Sex, School, and Grade

Total Count *School CL School CE School WI	Sex Male	 Female	Row Total/Pct	Total District Population: Male/Female
Grade 4	17	24	41/29.1	67/77
	1	1	2	
	5	8	13	
	11	15	28	
Grade 5	17	28	45/31.9	86/76
	4	10	14	
	5	5	10	
	8	13	21	
Grade 6	25	30	55/39.0	71/78
	5	8	13	
	12	14	26	
	8	8	16	
Column Total/Pct	59 41.8	82 58.2	141 100.0	224/231 49.2/50.8

* - schools are Crystal Lake, CEnter, and WIndemere

The talent pool population in Watertown which was included in this study is given in Table 4-2 below, broken down by grade and sex. The total number of students in each grade for the district is also shown. A total of 298 students were in the talent pool for grades 3-6 in Watertown which was roughly 29% of the total population for those grades. Through some error in data collection, CPI's were not completed on students in Griffin Elementary School (n=40) nor

Table 4-2. Frequencies and Percentages of Subjects in Watertown by Sex, School, and Grade.

Total Count *School PO School GR School JU School BA School HE	Sex Male	Female	Row Total/Pct
Grade 3	40	39	79/29.2
	7	9	16
	8	10	18
	16	14	30
	9	6	15
	0	0	0 (no grade 3)
Grade 4	34	50	84/31.0
	4	10	14
	9	13	22
	14	14	28
	7	13	20
	0	0	0 (no grade 4)
Grade 5	22	29	51/18.8
	0	0	0 (no grade 5)
	0	0	0 (no grade 5)
	12	15	27
	0	0	0 (no grade 5)
	10	14	24
Grade 6	23	33	57/21.0
	0	0	0 (no grade 6)
	0	0	0 (no grade 6)
	0	0	0 (no grade 6)
	0	0	0 (no grade 6)
	23	34	57
Column Total/Pct	119 43.9	152 56.1	271 100.0

* - schools are POlk, GRiffin, JUdson, BAldwin and HEminway

Baldwin Elementary School (n=35), nor on most of the sixth graders in Heminway Park School (n=37). Table 3-3 shows the number of students rated on the CPI broken down by school and grade. CPI data was unavailable for 215 talent pool students. The reason for this missing data was a combination of the loss of data package and the unwillingness of regular classroom teachers to complete the CPI on talent pool students in their class.

Table 3-3. Frequencies and Percentages of Subjects Rated on CPI by School and Grade

Count / Row Pct / Col Pct / Tot Pct	Grade 3	4	5	6	Row Total
School PO	15	9	*	*	24
	36.6	17.6			
	62.5	37.5			100.0
	7.6	4.6			12.2
School JU	26	26	23	*	75
	63.4	51.0	34.3		
	34.7	34.7	30.7		100.0
	13.2	13.2	11.7		38.1
School HE	*	*	18	20	38
			26.9	52.6	
			47.4	52.6	100.0
			9.1	10.2	19.3
School CL	*	2	8	*	10
		3.9	11.9		
		20.0	80.0		100.0
		1.0	4.1		5.1
School CE	*	*	5	18	23
			7.5	47.4	
			21.7	78.3	100.0
			2.5	9.1	11.7
School WI	*	14	13	*	27
		27.5	19.4		
		51.9	48.1		100.0
		7.1	6.6		13.7
Column Total/Pct	41	51	67	38	197
	20.8	25.9	34.0	19.3	100.0

* - no grade level in school

Birthdays were available for the subjects from Watertown, so ages could be computed using June 1, 1982 as a reference point. In the screening phase of the identification procedure in Watertown, in which students entered the talent pool, teacher, parent, and self-nominations were used as entry criteria. Data were coded according to the combination of nominations students received. Some students received no nominations and entered the talent pool on test scores alone.

SPAFs on those who completed a Type III product were collected at the end of the school year. In addition to the data from the individual items, information was also collected on the subject area of the product, the number of weeks spent on the product, the number of people involved, the number of products done, and the TAG teacher who did the product assessment and also worked with the student.

Since two or more people worked on most of the products, SPAF information is duplicated for many subjects. The one difference among students working on the same product is the number of products they completed. This raised a problem, though, in deciding which product rating to use as data for students who did more than one. The decision was made to use the higher rating, since a student who completes an extra product in the same time given all students is likely to be more creatively productive and deserves the best assessment possible. An evaluation of a person's developmental level of creative ability should emphasize the best work he or she has done, since that offers tangible evidence of the extent of his or her ability.

RESULTS

In this chapter, the results of statistical analyses performed on the data collected in this study will be presented. The relationship of IQ to other measures administered in Ellington will be examined. The reliability of the CPI subscales will be described for all subjects in both school districts and after which a factor analysis to determine if the subscales will emerge intact as factors will be described. Then, students of different sex, grade, and school district will be put into their respective groups in order to determine if these variables had an effect on the CPI. Since the birthdays of students in Watertown was obtained, the relationship of age to CPI scores will be noted next. The hypothesis that the CPI scores can predict the subject areas of students' Type III products will be tested. Finally, the question of whether the CPI scores offer incremental validity to the established identification procedures in each school district will be addressed.

Relationship of IQ to Other Variables in Ellington

Intelligence test score data were available only in Ellington on 89 students on which there was also CPI data (see Appendix B for information on the IQ test used). This provided the opportunity to examine the correlation of general intelligence with other variables just for the Ellington sample. Intelligence test scores for the talent pool were generally above average to very superior, so correlations are expected to be low, even if significant. This is because variables measured over restricted ranges always correlate less than when measured over their full ranges.

Ellington also used a point system for screening students into the talent pool. Teacher recommendations, IQ, achievement test scores, and

grades were scaled 0-8. The combined point total (called "points" hereafter) for teacher recommendation and grades was available on 27 students, allowing these two variables as a whole to be looked at in relationship to other variables. It is assumed that these variables were strongly related, but there is no empirical evidence to support this assumption.

The IQ was found to intercorrelate strongly with the achievement test scores and points. Table 4-1 below shows the correlation matrix with level of significance, numbers of subjects, means, and standard deviations given for each of these variables.

As can be seen, all correlations are highly significant except for those showing the relationship of points to math and reading achievement; points correlates significantly with achievement test total, though. IQ shares the most variance with the reading achievement subtest score (14%), which is explained by the fact that the intelligence test used, the Otis-Lennon, is considered to be primarily a measure of verbal intelligence. While 14% seems a small amount of shared variance, both the intelligence and the achievement variables were being measured over a highly restricted range.

Table 4-1. Correlation Matrix of IQ, Achievement Test National Percentiles, and Points in Ellington

	IQ	Rding Ach	Math Ach	Total Ach	mean/n sd
IQ					127/134 ----- 7.70
Reading Ach	0.3749 (n=99) p=.000				85.94/106 ----- 12.82
Math Ach	0.2802 (n=99) p=.002	0.2835 (n=106) p=.002			83.83/106 ----- 11.05
Total Ach	0.2431 (n=99) p=.008	0.5760 (n=106) p=.000	0.6120 (n=106) p=.000		90.71/106 ----- 7.43
Points	0.3362 (n=27) p=.043	0.2204 (n=27) p=.135	0.1113 (n=27) p=.290	0.3565 (n=27) p=.034	14.16/27 ----- 1.59

Another correlation of interest is that between points and total achievement test score. While it is difficult to know whether the

points were more the result of teacher recommendations or grades, it seems that verbal intelligence is related to each or both of these components.

The question may next be asked if intelligence or points have any relationship to the decision to revolve in a talent pool student. The results of two t-tests are shown below in Table 4-2, along with n's, means, and standard deviations for each group. The difference in IQ between those revolved in or not is highly significant, with students revolving in having a higher mean score. Those students who revolved in also had a significantly higher point total, which suggests that those with higher grades and/or teacher recommendations had a better chance of being revolved in.

Table 4-2. T-tests on IQ and Points Comparing Groups Revolving In and Completing Type III Product or Not

Revolved In	n	Mean	sd	Pooled t-value	df	Prob.
			Otis-Lennon IQ			
No	77	125.71	7.574			
				-2.51	131	.013
Yes	56	129.05	7.566			
			Points			
No	20	13.675	1.422			
				-3.12	25	.005
Yes	7	15.571	1.216			

It seems pertinent to report here that when a discriminant function analysis was performed in an attempt to differentiate among those students who had done only one Type III product as opposed to two, IQ proved to be the single significant discriminating variable. The six students who did two products scored lower on the IQ test (mean=124.5) than did the fifty students who did only one product (mean=129.6). Owing to the small number of subjects involved in this analysis, the results may be due to chance alone.

The question may next arise as to whether IQ shares a significant amount of variance with the SPAF ratings. Pearson correlation coefficients were computed between IQ and all individual SPAF items as well as the two combined SPAF ratings on student performance and product. Only the rating of the level of resources (item 3) showed a significant correlation, and that was in the negative direction. One might expect those students with higher IQs to use more complex resources, but not the other way around! IQ correlated -.12 with the combined SPAF total, demonstrating no significant influence on SPAF ratings. Correlations between IQ and CPI subscale and scale totals were also all nonsignificant, none being greater than .068

in magnitude. From these results, it would seem that teacher ratings of creativity were independent of verbal intelligence, while teacher recommendations might not be.

The GIFT measure did show some relationship to IQ. Correlation coefficients between the IQ and the subscales for 89 subjects were .075 (Interest), .180 (Independence), and -.252 (Imagination). While sharing comparatively little variance, the correlations of IQ with the Independence and Imagination subscales are significant beyond the .05 level and .01 level, respectively. Correlations of IQ with the GIFT total and GIFT normal curve equivalent score are both below .06 and nonsignificant, demonstrating the independence of the two measures. The highest correlation between the GIFT subscale of Imagination and IQ is in the negative direction, indicating a negative relationship between imagination and intelligence.

The Partial Correlation of CPI to GIFT and Achievement

The partial correlation of CPI to GIFT and Achievement Test scores controlling for sex, grade, and school, is given in Table 4-3 accompanied by levels of significance. Local percentiles for achievement test scores were available for Watertown only. The most striking set of partial correlations are those between CPI and local math achievement percentiles, which are all significant. This accounts for the significant correlations between local total achievement and CPI. Also significant are the partial correlations between national percentile ranking for total achievement in both school districts and the Contact and Fantasy Dimensions. Correlations between the Interest subscale of GIFT and three CPI dimensions approached significance, $p < .10$. The CPI is more strongly related to achievement scores than to GIFT, another measure of creativity, which is contrary to expectation.

Certainty of Teacher Ratings Using CPI

The last question on the CPI rating form sought to tap the degree of certainty that raters would attach to their overall rating. Table 4-4 below displays the frequency of certainty ratings. Ratings were generally high; 78.2% of the ratings were at the top third of the scale, from 7-10. Pearson correlations between certainty and scores on each subscale and the total were computed and were all strongly positive and significant, ranging from .24 for the Interest Dimension to .50 for the Fantasy Dimension. This indicates that the higher the rating, the more certain the rater was of the assessment.

Reliability of CPI Subscales and Factor Analysis of CPI Items

An estimate of the internal consistency of the CPI subscales was determined for 197 subjects in both school districts. Cronbach's alpha was calculated for each subscale. Coefficients for each subscale were

Table 4-3. Partial Correlations of CPI with Achievement Test and GIFT Scores Controlling for Sex, Grade, and School

Variables	CPI Dimensions Contact	Consciousness	Interest	Fantasy
Interest Subscale of GIFT	.1133 (158)* ns	.0814 (158) ns	.1274 (158) ns	.1075 (158) ns
GIFT Total Score	.0942 (158) ns	.0336 (158) ns	.0751 (158) ns	.1340 (158) p=.046
Total Ach (National Percentile)	.1813 (128) p=.020	.1260 (128) ns	.0525 (128) ns	.2195 (128) p=.006
Reading Ach (National Percentile)	.1201 (128) ns	.0835 (128) ns	.0523 (128) ns	.1952 (133) p=.013
Total Ach (Local Percentile)	.3824 (69) p=.000	.2845 (69) p=.008	.2365 (69) p=.024	.4043 (69) p=.000
Math Ach (Local Percentile)	.1973 (69) p=.050	.2070 (69) p=.042	.2846 (69) p=.008	.2422 (69) p=.021

* - degrees of freedom
(Note: Imagination and Independence subscale scores of GIFT and local reading and national math achievement percentiles are not included in Table 4-3 because they yield nonsignificant partial correlations with CPI.)

Table 4-4. Frequencies and Percentages of Certainty of CPI Ratings

Rating of Certainty*	Absolute Freq	Relative Percent	Cumulative Percent
4	2	1.0	1.0
5	15	7.6	8.6
6	26	13.2	21.8
7	29	14.7	36.5
8	56	28.4	65.0
9	52	26.4	91.4
10	17	8.6	100.0
TOTAL	197	100.0	100.0

* - on a scale from 0 (low) to 10 (high)

.917 (Contact Dimension), .940 (Consciousness Dimension), .979 (Interest Dimension), and .905 (Fantasy Dimension). Except for the Contact Dimension, each dimensional subscale shows greater internal consistency than was found in the pilot study and with fewer items. Of course, the number of subjects in this case is higher than in the pilot study.

A principal components analysis was performed on the CPI items to determine if underlying factors were congruent with the subscales that were planned into the total scale. Using an oblique rotation with Kaiser normalization, three independent factors emerged with no double loadings.

Table 4-5 gives factor loadings for CPI items grouped into subscales. Important factor loadings are starred. Factor 3 contains only the seven items of the Interest Dimension; the underlying construct is clearly tapping the construct defined by that dimension. Factors 1 and 2 are less clearly defined. Factor intercorrelations were .54 (1 & 2), -.68 (1 & 3), and -.38 (2 & 3).

Pearson correlation coefficients were computed among the factors and the GIFT subscales to check for relationships among the underlying constructs. Factor 2 was the only factor that showed a significant relationship to any subscale of the GIFT, correlating .19 with Interests, $p < .01$, and .17, $p < .02$, with Imagination. The underlying construct of Factor 2 therefore shows some convergent validity. The Interest subscale of GIFT indicates many interests and hobbies, which is related to curiosity, and the Imagination subscale is, of course, supposed to tap imaginativeness. A re-analysis of the relationship of CPI to IQ using the new factor structure shows a nonsignificant relationship between the factors and IQ, with Pearson correlation coefficients for Factors 1, 2, and 3 being .04, -.10, and -.06, respectively. Analyses that follow using CPI dimensions were duplicated with CPI factors. Results are given in Appendix G. Outcomes using CPI factors were weaker and less interpretable.

Relationships of CPI to Age, Sex, District, and Grade

CPI and Age

Data on birthdays were only available in Watertown, so the exact age of subjects could only be calculated for students from that school district. Table 4-6 presents the Pearson correlation coefficients for age by the CPI subscales. Age (range 7.44 - 11.32 years, mean 9.61) was significantly related to the Consciousness and Interest Dimensions. The older the students, the more they were perceived by teacher raters as more aware of underlying meaning, more likely to dispute authority and ask questions, as well as being more task committed in their work.

CPI and Sex

An inspection of the means on the CPI subscales for each sex revealed that girls were rated higher. A consideration of the significant correlation between achievement and CPI scores led to an analysis of the interaction of sex and achievement on the CPI total score. Regression analysis showed the interaction of sex and local achievement test percentile scores

Table 4-5. Factor Loadings for 28 Items in CPI (n=197)

Item	Dimension	Factor 1	Factor 2	Factor 3
#2	C	0.76311*	-0.06155	-0.20860
#3	O	-0.06956	0.74794*	-0.32600
#10	N	0.75338*	0.05101	0.05464
#13	T	0.60126*	0.19759	-0.13483
#15	A	-0.08521	0.80249*	-0.27257
#19	C	-0.08246	0.75484*	-0.34933
#25	T	0.69853*	-0.02104	-0.24826
#6	C	0.80931*	-0.09235	-0.19923
#7	ON	0.91077*	-0.09551	-0.08926
#8	SC	0.81300*	0.11601	0.04803
#14	IO	0.75955*	-0.01549	-0.18760
#18	US	0.73369*	-0.03079	-0.23790
#23	NE	0.13231	0.69115*	-0.10744
#24	SS	0.74208*	0.29942	0.16182
#4	I	0.27340	0.14093	-0.66987*
#9	N	0.19862	0.09287	-0.75341*
#16	T	0.16929	-0.04775	-0.85169*
#17	ER	0.09897	0.12789	-0.80950*
#20	E	0.15035	0.13494	-0.74554*
#21	S	0.17216	0.06699	-0.76385*
#22	T	0.20999	0.10345	-0.71941*
#1	F	0.10553	0.67672*	-0.19222
#5	A	0.87813*	0.01282	-0.00951
#11	N	0.12869	0.85268*	0.14119
#12	T	0.15648	0.85563*	0.17874
#26	A	0.86034*	0.04178	0.01983
#27	S	0.90655*	-0.02069	0.04509
#28	Y	0.00890	0.89753*	0.14389

* - loadings greater than .60

Table 4-6. Correlations between Age and CPI Subscales for Watertown Sample (n=81)

	Contact	Consciousness	Interest	Fantasy
Age	.11	.19*	.26**	.14

*$p < .05$ **$p < .01$

in Watertown to be highly significant, F (3,70) = 21.88, $p < .001$. Further analysis for the whole sample using national achievement test percentile scores also revealed a significant interaction, F (3,130) = 6.85, $p < .01$. Girls who were higher on achievement were rated higher on the CPI, while boys' ratings were unrelated to achievement.

CPI and School District

A multivariate analysis of variance (MANOVA) comparing the means on the CPI subscales for each school district yielded significant results, F (4,192) = 26.07, $p < .001$. However, post hoc analyses failed to show a consistent trend across districts. The mean CPI totals were virtually identical with less than .2 points difference between Watertown (n=96, mean=141.52) and Ellington (n=60, mean=141.70). Significance was reached on the MANOVA because students in Watertown were rated higher by their teachers in the Contact and Fantasy Dimensions, with the latter being a significant difference. Students in Ellington were rated higher on Consciousness and Interest Dimensions, with the latter being a significant difference.

CPI and Grade

A MANOVA was performed on the CPI subscales with grade levels nested within district. This design takes into consideration differences between the school districts when comparing means for grade levels. Results were significant, so a posteriori contrasts were computed from oneway analyses of variance using Tukey's honestly significant differences procedure. Table 4-7 shows sixth graders to have significantly lower mean scores than the other grade groups on every dimension. Up to the sixth grade, CPI scores increase with age, then fall off significantly.

Further analyses were done to test the differences between the grade levels and schools on other independent variables. A t-test comparing the districts on achievement reveals that the mean test score for Ellington students was significantly below the Watertown mean. The difference was largely the result of sixth graders at Center School (n=18) having significantly lower mean achievement percentile scores than Heminway sixth graders (n=20). Differences might be due to the fact that the districts were using different achievement tests. Center school sixth graders were also significantly below Heminway sixth graders on the CPI and the Imagination and Independence subscales of the GIFT. Post hoc analyses on 317 students in both districts reveal that on the GIFT Total and Independence subscale, the sixth grade was highest, significantly more so than the third and fourth grades, but on the Imagination scale, the third and fourth grades were significantly higher than the fifth and sixth grades. Conclusions that may be drawn from these results are (1) the sixth graders see themselves as being less imaginative and are perceived by their teachers as being less creative, (2) Ellington students are lower in achievement than Watertown students, but not necessarily lower on creativity, and (3) the sixth graders at Center School are lowest in self-perceived and teacher-rated creativity than all

Table 4-7. Means, Sd's, and N's of Students on Each CPI Dimension by Grade (Total n=197)

Grade	n	Mean	sd	Grade 3	4	5	6
	Contact Dimension						
3	41	34.9512	9.5445				
4	51	38.4706	12.0753				
5	67	40.5672	11.9636				
6	38	26.6316	12.0347	*	*	*	
		-------	-------				
Grand Mean		36.1675	12.5404				
	Consciousness Dimension						
3	41	29.8537	9.0569				
4	51	32.5490	12.8954				
5	67	39.3433	13.5272	*	*		*
6	38	26.8158	11.9794				
		-------	--------				
Grand Mean		33.1929	13.0815				
	Interest Dimension						
3	41	26.0732	10.4723		*	*	
4	51	33.8823	15.3683				
5	67	39.2836	15.9276				
6	38	24.0263	11.9650		*	*	
		-------	-------				
Grand Mean		32.1929	15.2898				
	Fantasy Dimension						
3	41	36.7073	9.6702				
4	51	39.0196	12.4024				
5	67	41.3731	12.1802				
6	38	27.5263	12.8057	*	*	*	
		-------	-------				
Grand Mean		37.1218	12.8156				

* -denotes pairs of groups significantly different at the .05 level (Tukey HSD)

other groups and lower in academic achievement than sixth graders at Heminway School.

Predicting Content Areas of Type III Products with CPI

Type III products were categorized as being in the areas of art or science, and then further broken down into specific types, e.g., creative writing, photo essays, lab experiments, dissections, etc. For the Ellington sample, a multivariate analysis of variance was performed on students divided into groups doing either an art (n=7) or science (n=25) project

using the four CPI subscales. No significant differences were found. A canonical variate analysis was performed with CPI subscales forming one composite and Type III product types dummy coded separately and grouped to form the second composite function. No canonical correlation coefficient was significant. The conclusion therefore is that CPI subscales cannot be used to explain variance in Type III product areas.

Predicting Product Completion and Product Quality

The relationship of CPI to product completion and product quality was assessed through the use of three statistical methods. A MANOVA was performed comparing the two groups doing a Type III product or not on the CPI subscales. Discriminant function analysis (DFA) was used to determine the group of independent variables that most accurately classified the two groups into their actual membership categories. Regression analysis determined how well the CPI predicts SPAF total scores over and above the instruments utilized in Ellington's identification procedure. Data from Watertown concerning Type III products was not available in time to include here.

SPAF ratings completed by the two TAG teachers in Ellington were compared using a t-test with nonsignificant results, allowing a pooling of all SPAF ratings. A MANOVA comparing the two groups doing a Type III product or not on the CPI subscales yielded significant results, F (4,55) = 7.58, $p < .001$. Univariate F-tests with 1 and 58 degrees of freedom revealed that all CPI subscales showed significant differences except for the Contact Dimension.

Discriminant function analysis was performed on the Ellington data with IQ, math and reading achievement scores forced in first, then CPI subscales entered as the second block. Table 4-8 presents the F-values

Table 4-8. Results of DFA for Groups Completing Type III Product or Not for IQ, Achievement, and CPI Subscale Scores (n=56)

Block Order	Variable	F-value to remove	Standardized Coefficients
1	IQ	3.9475	0.43825
	Math Ach	3.0920	0.38857
	Reading Ach	(not entered)	
2	Contact Dimension	14.1400*	-1.65414
	Interest Dimension	22.8420*	1.48944
	Fantasy Dimension	7.3866*	0.89249
	Consciousness Dimension	(not entered)	

* - significant at the .05 level (F>4.03, df=1,54)

for this analysis as well as the standardized canonical discriminant function coefficients showing the relative value of each variable. Only subscales of the CPI, i.e., Contact, Interest, and Fantasy Dimensions, were significant. The information supplied by IQ and Achievement test scores can therefore be considered irrelevant for predicting which students will be revolved in for Type III enrichment activities. Table 4-9 shows the DFA classification results, showing the accuracy with which group membership is predicted based on the variables used.

Table 4-9. Classification Results of DFA For Groups Completing Type III Product or Not for IQ, Achievement, and CPI Subscale Scores (n=56)

		Predicted Group Membership	
Actual Group	n	1	2
Group 1 (No Type III Done)	24	19 79.2%	5 20.8%
Group 2 (Type III Done)	32	7 21.9%	25 78.1%

Percent of "Grouped" Cases Correctly Classified: 78.57%

A DFA was next performed using only the CPI dimensions to predict whether a student completed a Type III product or not. Tables 4-10 and 4-11 below present the pertinent statistics. The percentage of hits for the discriminant function that includes only CPI dimensions is slightly higher than when IQ and math achievement were also included. Correcting the percent of "grouped" cases correctly classified by chance by applying Cohen's Kappa, it turns out that the accuracy of preciction is 65%. This figure represents a 15% improvement over the 50-50 chance level in predictive accuracy to be expected from merely flipping a coin to determine which of two groups a student is in. The improvement would occur if a discriminant function was constructed using the coefficients from Table 4-10.

Table 4-10. Results of DFA for Groups Completing Type III Product or Not for CPI Subscales Only (n=60)

Variable	F-value to remove	Standardized Coefficients
Contact Dimension	16.8860	-2.66588
Consciousness Dimension	9.8374	1.82711
Interest Dimension	16.0540	1.40399
Fantasy Dimension	(not entered)	

* - significant at the .05 level ($F>4.03$, df=1,54)

Table 4-11. Classification Results of DFA For Groups Completing Type III Product or Not for CPI Scores Only (n=60)

Actual Group	n	Predicted Group Membership 1	2
Group 1 (No TypeIII Done)	25	21 84.0%	4 16.0%
Group 2 (Type III Done)	35	7 20.0%	28 80.0%

Percent of "Grouped" Cases Correctly Classified: 81.67%

Two additional details taken from Tables 4-8 and 4-10 are worth noting. First, the Contact and Interest Dimensions remain stable contributors to prediction as shown in each table, but the Consciousness and Fantasy Dimensions alternate in providing significant amounts of information. In the presence of IQ and achievement, Fantasy ratings provide worthwhile additional information while Consciousness ratings do not. This situation is reversed when only CPI subscales are used to construct the discriminant functions.

Second, it can be seen that the Contact Dimension has a negative coefficient in both tables, indicating a negative weighting in the discriminant functions. To explain this result, consider two students who have equal scores on all dimensions except contact. The student who is higher on Contact will be less likely to complete a product. The small sample involved in the DFA's reduces the external validity of all conclusions drawn, however.

According to the above results, the CPI by itself offers high predictive accuracy. Canonical correlations for the discriminant functions described in Tables 4-8 and 4-10 are .59 and .67, respectively. This means that the CPI explains 45% of the variance between groups who did a Type III product or not versus 35% when IQ and Achievement scores are included, an improvement of 10%. The accuracy of prediction for the discriminant function based on the coefficients in Table 4-8 is 57%, which demonstrates an 8% decrease in accuracy of prediction. The CPI can be used to explain almost half the variance between the groups, a substantial percentage.

SPAF totals were regressed on IQ, achievement test subscales, grade level, school and CPI subscales. Grade level was dummy coded into two vectors, and school was dummy coded into one vector representing Center School or other Schools. Using a stepwise analysis that allowed control over the sequence of inclusion, IQ and achievement variables were considered simultaneously, after which the grade level vectors were included as a block, then the Center School vector was included, and finally the CPI subscales were entered into the analysis. None of the variables or groups of variables produced a significant F-value, so a significant amount of true variance was not explained. While thirty-five students in

Ellington for which there was CPI data worked on Type III products, most of the students worked in pairs or larger groups. This reduces the variance of the SPAF totals and may be a factor in the failure to reach significance on the regression analysis.

Summary

The CPI was shown in this chapter to be internally consistent and stable, and to be a valid predictor of creative productivity. Teachers who completed the CPI indicated that they were highly certain of their assessments. They appear to be rating something distinct from convergent thinking ability, as evidenced by the small amount of shared variance between the CPI and IQ and Achievement Test percentile scores. CPI ratings were shown to increase from grade 3 to grade 5, but at the sixth grade ratings were significantly lower. Sex and achievement interacted in their relationship to CPI ratings, with girls' ratings correlating with achievement while boys' scores didn't.

The finding that provided the most positive evidence for the construct validity of the CPI comes from two discriminant function analyses. The CPI proved to be effective in predicting whether a student would complete a Type III product. Predictive accuracy was greater for the CPI alone than a combination of the CPI and IQ and Achievement Test scores. How well the content areas of students products would be predicted by CPI was tested with nonsignificant results. The CPI also was unable to predict product quality as rated on the SPAF.

DISCUSSION

The CPI proved to be a valid instrument for differentiating students who started on and completed Type III products from students who remained in the talent pool in school districts using the RDIM approach to gifted education. The internal validity of these findings is weakened by having had teachers complete the CPI near the end of the school year; they could have been influenced by knowledge of students' product outcomes. Research on the CPI must next concentrate on obtaining teacher ratings in the early part of the year, before projects are begun. Or, teacher ratings could be obtained at the end of the year and product completion data collected the following year. While this would not entirely remove the possibility of a rater bias, since teachers might still be aware of past student products, it should limit it, especially for students in the younger grades.

The finding that the CPI was related to achievement test scores supports previous research results. Teacher ratings have not been found to be independent of such measures in the past. Yet, shared variance between CPI and achievement never exceeded 16% and tended to be much lower. CPI was unrelated to general intelligence, though, while teacher recommendations and grades were related to intelligence. The theory underlying

the CPI which proposes that creativity and intellectual ability are independent, but not mutually exclusive, factors was supported by these findings.

GIFT subscales showed some relationship to IQ and achievement, even if the GIFT total did not. Research on the GIFT has concentrated on its relationship to student art and short stories, but not to measures of general intelligence; perhaps this should be done. The relationship of CPI to cognitive measures, especially creativity tests, should be further investigated. In particular, hypotheses may be posed concerning the results of the discriminant function analyses. Some kind of interaction between the Consciousness Dimension and the cognitive measures used was apparent in the prediction of creative productivity.

The finding that students who revolved in were higher on IQ, grades, and teacher recommendations is of interest. Students who completed two products were lower in IQ than those completing one product. With respect to submitting project plans, do teachers give more encouragement to students with good grades who they recommend highly? Are the most highly intelligent students from the talent pool more likely to revolve in but no more likely to complete a product of high quality than students of lower but still above average intelligence? Intelligence was unrelated to SPAF totals, a measure of product quality. A small sample size comprised of subjects from one school district was used, so further work with larger samples is needed before the relationship between measured intelligence and product quality can be dismissed as irrelevant.

One peculiar finding concerning IQ and SPAF was that the only SPAF item that correlated significantly with IQ, but in the negative direction, was level of resources. This may be a spurious finding based on chance alone. Without a detailed explanation of how the TAG teachers rated the level of resources, an answer to this paradox is beyond the scope of this study.

Other findings that may be spurious results of small sample size are seen in the discriminant function analyses. When IQ and achievement are included in the analysis, the Consciousness Dimension was not entered while all other dimensions were entered and significant. Just using the CPI subscales in the analysis while the Consciousness Dimension is entered and significant. It appears that the Consciousness Dimension is sharing variance in creative productivity with the standardized tests through some kind of complicated interaction. In each analysis subjects are being placed in eight separate cells, which spreads 56 subjects pretty thinly. A few subjects changing cell positions in each analysis could cause the observed effect on the two dimensions under discussion.

The negative coefficient for Contact in both discriminant functions done in this study may also be an effect of the small number of subjects in each of the eight cells involved in the DFAs. However, this finding is consistent over both DFAs, giving it more credibility. Despite the high correlations among the CPI subscales, ample variance remains unaccounted for on each dimension. The unexplained variance in Contact distinct from otherCPI dimensions may represent an aspect of creative behavior that serves to block the completion of a creative product. Such qualities as lack of focus or impulsiveness perhaps are being picked up in the rating of activities in the Contact Dimension.

The strong relationship between local math achievement percentile scores of students in Watertown and the CPI also merits further investigation. Somehow, student ability in math with respect to other students in the district was related to teacher assessment of creativity. This finding may be a result of a "gentle" halo effect since the shared variance between CPI and achievement was minimal.

Teachers tended to be more certain of their ratings on the CPI for students with higher ratings. Older students, particularly sixth graders, tended to be rated lower. It may turn out that the CPI is more applicable for younger students, on which teachers can make more certain ratings. This is not an altogether unpleasant finding, for the CPI was meant to fill a need to identify students who exhibited creativity characteristics but had not yet produced anything of merit. Younger students are less likely to have demonstrated mature creative productivity on which to base decisions about entry to special enrichment activities accenting productivity. The relationship between certainty of ratings, the ratings themselves, and age will have to be investigated further across a larger range of grades.

The value of the factor structure extracted from the CPI by factor analysis is uncertain. Supplemental analyses given in Appendix G revealed the factors to be less powerful in discriminating those who complete Type III products from those who do not. Future studies are needed to find out if the factor structure is stable and what relationship it has to other variables.

A significant interaction appeared between sex and achievement test scores with regard to total ratings on the CPI. Girls who were higher on achievement were rated higher on the CPI while no such effect existed for the boys. Girls and boys had roughly equivalent mean achievement scores while girls were rated higher on the CPI. This may mean that teachers interpret girls' creativity as being closely tied to their academic performance. For boys, creative behavior is perhaps considered to be something unrelated to academic achievement. In a future study, teachers' attitudes toward creative boys and girls could be measured along with CPI ratings. Interviews and other types of qualitative research would be of great value in investigating possible sources of sex-related bias in creativity ratings.

It is a matter of common sense to say that children in different school districts are different in intelligence, academic achievement, creativity, etc. In this study, it was discovered that children in the larger of two towns scored higher on standardized academic achievement testing, albeit on different tests. While the Watertown school district was larger than Ellington, schools in Watertown were not necessarily larger than those in Ellington, just more in number. CPI mean totals were virtually identical across towns. The effect of school district size on creativity may or may not be less important than the effect of school size. The economics of the community, whether teachers are natives, or any number of other unknown variables may be important in affecting creativity of students. Research has only touched on this area, and more needs to be done.

The value of various methods for identifying creative producers should be subject to extensive research. In this study, it was found that a

teacher rating scale of creativity was more valuable in identifying creative producers than either intelligence or achievement measures. Certainly, it would be worthwhile to subject other standardized measures to incremental validity analyses to determine their relative value.

Finally, the Creative Classification System should be subjected to further attempts at empirical validation. Its value in guiding the construction of the CPI has demonstrated its utility. One possible avenue of research would be for adults in a field to be rated by themselves and by friends, spouses, administrative superiors, etc., on characteristics based on the CCS. These ratings could be validated against criteria of creative production. Further investigation still needs to be done as to whether scores on the CPI dimensions can be used to diagnose relative strengths or weaknesses in creative production. A means for assessing such strengths and weaknesses would have to be developed.

Practical Suggestions for Gifted Education

The CPI has demonstrated high reliability and validity in identifying creatively productive students, so may be used in the identification procedure in a gifted program. Wallach's (1970) contention that teacher ratings are nothing but an estimation of a student's standing in academic achievement was not substantiated by the present findings.

The lack of predictive validity in identifying creatively productive students shown by standardized intelligence and achievement tests suggests that the use of these measures in selecting students for entry into gifted programs is inappropriate. Their primary use should be restricted to screening the student population of a school district for students above average in intelligence and academic achievement who may then be entered into a "talent pool". The results of this study therefore provide empirical support for the RDIM approach to identification.

The results of this study also argue against the use of a "rigid" point system in the selection process. Point systems usually give a greater number of points to students who score higher on standardized tests, with two sets of points being awarded for intelligence and achievement test scores. This compounds the error! Using a point system for screening purposes, however, is acceptable as a logistical expedient, if other pathways into the talent pool are still left open.

The adolescent "slump" in creativity, as indicated by a significant drop in creativity ratings for the sixth grade, deserves special attention. Some means must be developed for counteracting this phenomenon. Several researchers have suggested that the school system and society exert social pressures that increase conformity and diminish creative power. Implicit social rules and explicit reward and punishment systems discourage the use of the imagination and intuition as being illogical, untrainable, and unreliable. The result is an ignorance of individualized approaches to solving problems that are presently being studied under the rubric of learning styles. Without some form of support, creative students can fall victim to the denigration of any pursuit of knowledge and skills that falls outside the academic sphere of influence.

Most schools prevent students from bypassing areas of weakness that constitute learning disabilities rather than allowing them to concentrate on many worthwhile activities. Too many teachers insist that all work be done by all students regardless of its value for each student, or whether a student has already mastered the academic skills underlying an assignment. Any sign of rebelliousness on the part of students or teachers against this state of affairs is sharply rebuked. One alternative is an open discussion of parent, teacher, and student needs that can evolve into a system both flexible and multi-faceted in its approach to learning and problem solving.

Of course, the possibility exists that the most salient social pressure restricting the growth of students' creativity comes from the peer group. Regardless of whether peer pressure is simply another outlet for socialization pressures originating with the adult society, students at the age of puberty tend to be strongly affected by the reactions of their peers to their behavior. Group counseling would seem to be one appropriate means for penetrating group dynamics. Indeed, it has been the experience of this writer that one of the most worthwhile aspects of gifted education for students of this age is being with intellectual peers for guided discussions on personally relevant issues.

While the ultimate answer to the question, "What is the source of creativity?" remains elusive, there are some practical answers. People create to satisfy a need to excel, to satisfy someone, because of fascination with materials or a desire to make something more effective or efficient, to make money, to become famous, or just to be different. Whatever reason motivates an individual, whether others approve or not, creativity justifies itself if it is initiated with a constructive purpose in mind.

REFERENCES

Adams, J.L. Conceptual blockbusting: A guide to better ideas. San Francisco: W.H. Freeman, 1974.

Alamshah, W.H. "Creative living." Journal of Creative Behavior, 1970, 4, 123-130.

Alamshah, W.H. "Blockages to creativity." Journal of Creative Behavior, 1972, 6, 105-113.

Alvino, J., McDonnel, R.C., & Richert, S. "National survey of identification practices in gifted and talented education." Exceptional Children, 1981, 48, 124-132.

Anastasi, A. "Psychology, psychologists, and psychological testing." American Psychologist, 1967, 22, 297-306.

Anastasi, A. Psychological testing, (4th ed.). NY: MacMillan, 1976.

Anderson, H.H. "Creativity as personality development." in H.H. Anderson (Ed.), Creativity and its cultivation. NY: Harper & Brothers, 1959, pp.119-141.

Andrews, F.M. "Social and psychological factors which influence the creative process." in I. A. Taylor & J. W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 117-145.

Arnold, J.F. "Creativity in engineering." in P. Smith (Ed.), Creativity: An examination of the creative process. NY: Hastings House, 1959, pp.33-46.

Bandura, A. Social learning theory. Englewood Cliffs, NJ: Prentice-Hall, 1977.

Barro, A. R. "A comparison of two approaches to identifying creativity in graduate student writers." unpublished doctoral dissertation, University of California, Los Angeles, 1971.

Barron, F. "The relationship of ego diffusion to creative perception." in C.W. Taylor (Ed.), Widening horizons in creativity. NY: Wiley, 1964.

Barron, F. Creativity and personal freedom. NY: Van Nostrand, 1968.

Barron, F. Creative person and creative process. NY: Holt, Rinehart & Winston, 1969.

Bloom, B.S., & Sosniak, L.A. "Talent development vs. schooling." Educational Leadership, 1981, 39, 86-94.

Boring, E.G. "Intelligence as the tests test it." New Republic, 1923, 35-37.

Bouchard, T.J. "Whatever happened to brainstorming?" in S.J. Parnes, R.B. Noller & A.M. Biondi (Eds.), Guide to creative action. NY: Charles Scribner's Sons, 1977, pp. 189-192.

Buros, O. K. (Ed.), The seventh mental measurements yearbook (2 vols.). Highland Park, NJ: Gryphon, 1972.

Cacha, F.B. "Figural creativity, personality, and peer nominations of pre-adolescents." Gifted Child Quarterly, 1976, 20, 187-195.

Cambell, D.T., & Fiske, D.W. "Convergent and discriminant validation by the multitrait-multimethod matrix." Psychological Bulletin, 1959, 56, 81-105.

Cashdan, S., & Welsh, G.S. "Personality correlates of creative potential in talented high school students." Journal of Personality, 1966, 34, 445-455.

Cattell, J. McK. "A statistical study of eminent men." Popular Science Monthly, 1903, 62, 359-377.

Cattell, R.B., & Drevdahl, J.E. "Comparison of the personality profile of (16PF) of eminent researchers with that of eminent teachers and administrators and of the general population." British Journal of Psychology, 1955, 46, 248-261.

Chambers, J.A. "Beginning a multidimensional theory of creativity." Psychological Reports, 1969, 25, 779-799.

Cleeton, G.U. "Originality: A summary of experimental literature." Journal of Abnormal and Social Psychology, 1926, 21, 304-315.

Cobb, S. The importance of creativity. Metuchen, NJ: Scarecrow, 1967

Comprehensive Tests of Basic Skills. Monterey, CA: CTB/McGraw-Hill, 1970.

Coopersmith, S. The antecedents of self-esteem. San Francisco: W. H. Freeman, 1967.

Crockenberg, S.B. "Creativity tests: A boon or a boondoggle for education?" Review of Educational Research, 1972, 42, 27-45.

Crutchfield, R. S. "Conformity and creative thinking" in H.E. Gruber, G. Terrell & M. Wertheimer (Eds.), Contemporary approaches to creative thinking. New York: Atherton, 1962, pp.120-140.

Crutchfield, R.S. "The creative process." in M. Bloomberg (Ed.), Creativity: Theory and research. New Haven, CT: College and University Press, 1973, pp.57-74.

Cronbach, L.J. "Validity on parole: How can we go straight?" in W.B. Schrader (Ed.), New directions for testing and measurement. San Francisco: Jossey-Bass, 1980, pp.99-108.

Dansky, J.L., & Silverman, I.W. "Effects of play on associative fluency in preschool-aged children." Developmental Psychology, 1973, 9, 44-54.

Dansky, J.L., & Silverman, I.W. "Play: A general facilitator of associative fluency." Developmental Psychology, 1975, 11, 104.

Davis, G.A., Peterson, J.M., & Farley, F.H. "Attitudes, motivation, sensation seeking, and belief in ESP as predictors of real creative behavior." Journal of Creative Behavior, 1974, 8, 31-39.

Day, H.I., & Langevin, R. "Curiosity and intelligence: Two necessary conditions for a high level of creativity." Journal of Special Education, 1969, 3, 263-268.

Dearborn, G.V. "A study of imagination." American Journal of Psychology, 1898, 9, 183-190.

DeBono, E. Lateral thinking. NY: Harper, 1972.

Dellas, N., & Gaier,E.L. "Identification of creativity: The individual." Psychological Bulletin, 1970, 73, 55-73.

deMille, R., & Merrifield, P.R. (Review of Creativity and Intelligence by J.C. Getzels and P.W. Jackson). Educational and Psychological Measurement, 1962, 22, 803-808.

Dunn, S.S. "Pattern and process in mental measurement." Austrian Journal of Psychology, 1962, 14, 165-181.

Durost, W.N., Bixler, H.H., Wrightstone, J.W., Prescott, G.A., & Balow, I.H. Metopolitan Achievement Tests. NY: Harcourt Brace Jovanovich, 1971.

Feldhusen, J.F. & Treffinger, D.J. Creative thinking and problem solving in gifted education. Dubuque, IO: Kendall/Hunt, 1977.

Fliegler, L.A. "Dimensions of the creative process." in M.F. Andrews (Ed.), Creativity and psychological health. Syracuse: Syracuse University, 1961, pp.13-24.

Freeman, J. Gifted children. Baltimore: University Park, 1979.

Freud, S. Creative writers and daydreaming" in A. Rothenberg & C. R. Hausman (Eds.) The creativity question. Durham, NC: Duke, 1976, pp.48-54.

Fromm, E. "The creative attitude." in H.H. Anderson (Ed.), Creativity and its cultivation. NY: Harper, 1959, pp.44-54.

Gallagher, J.J. Research summary on gifted child education. Springfield, IL: Superintendent of Public Instruction, State of Illinois 1966.

Galton, F. Hereditary genius: An inquiry into its laws and consequences. NY: Horizon, 1952. (Originally published, 1869.)

Getzels, J.W., & Csikszentmihalyi, M. "From problem solving to problem finding." in I. A. Taylor & J. W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 90-116.

Getzels, J.C, & Jackson, P.W. Creativity and Intelligence. NY: Wiley, 1962.

Ghiselin, B. The creative process: A symposium. Berkely, CA: University of California, 1952

Ghiselli, E.E. "The validity of occupational selection tests." Personnel Psychology, 1973, 26, 1-36.

Gilchrist, M. The psychology of creativty. Carlton, Victoria: Melbourne University, 1972.

Golann, S.E. "Psychological study of creativity." Psychological Bulletin, 1963, 60, 548-565.

Gordon, W.J.J. Synectics. NY:Harper, 1961.

Gough, H.G. "Techniques for identifying the creative research scientist." in Proceedings of "The creative person." Conference presented at The Tahoe Alumni Center, Oct. 13-17, 1961. Berkeley: University of Cali-

fornia, Institute of Personality Assessment and Research, and Liberal Arts Department.

Gough, H.G. "Identifying the creative man." Journal of Value Engineering, 1964, 2, 5-12.

Gowan. J.C. Development of the creative individual. San Diego: Knapp, 1972.

Gowan. J.C. Development of the psychedelic individual. San Diego: Author, 1974.

Gowan. J.C. Trance, art, and creativity. San Diego: Knapp, 1975.

Gowan. J.C., Demos, G., & Torrance, E.P. Creativity: Its educational implications. NY: John Wiley and Sons, 1967.

Groch, J. The right to create. Boston: Little, Brown, 1969.

Guilford, J.P. "Creativity." American Psychologist, 1950, 5, 444-454.

Guilford, J.P. The nature of human intelligence. New York: McGraw Hill, 1967. (a)

Guilford, J.P. "Creativity: Yesterday, today, and tomorrow." Journal of Creative Behavior, 1967, 1, 3-14. (b)

Guilford, J.P. "Measurement of creativity." in R. Mooney & T.A. Razik (Eds.), Explorations in creativity. NY: Harper & Row, 1967, pp. 281-287. (c) 1, 3-14. (b)

Guilford, J.P. "Some misconceptions regarding measurement of creative talents." Journal of Creative Behavior, 1971, 5, 77-87.

Guilford, J.P. "Creativity: A quarter century of progress." in I. A. Taylor & J. W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 37-59.

Gutman, H. "The biological roots of creativity." in R.L. Mooney & T. A. Razik. (Eds.), Explorations in creativity. New York: Harper & Row, 1967, pp. 3-33.

Hadamard, J. The psychology of the invention in the mathematical field. NY: Dover, 1954.

Hallahan, D. P., & Kaufman, J. M. Introduction to learning disabilities: A psycho-behavioral approach. Englewood Cliffs, N.J.: Prentice-Hall, 1976.

Halpern, F. C. "Clinicians must listen!" School Psychologist Newsletter, 1971, 28, 741-742.

Havelka, J. "Problem-seeking behavior in rats." Canadian Journal of Psychology, 1956, 10, 91-97.

Helson, R. "Personality of women with imaginative and artistic interests: The role of masculinity, originality, and other characteristics of creativity." Journal of Personality, 1966, 34, 1-25.

Helson, R. "Sex differences in creative style." Journal of Personality, 1967, 35, 214-233.

Helson, R. "Generality of sex differences in creative style." Journal of Personality, 1968, 36, 33-48.

Helson, R. "Women mathematicians and the creative personality." Journal of Consulting and Clinical Psychology, 1971, 36, 210-220.

Helson, R., & Crutchfield, R.S. "Mathmeticians: The creative researcher and the average PhD." Journal of Consulting and Clinical Psychology, 1970, 34, 250-257.

Holland, J.L. "Some limitations of teacher ratings as predictors of creativity." Journal of Educational Psychology, 1959, 50, 219-223.

Holland, J.L. "The prediction of college grades from personality and aptitude variables." Journal of Educational Psychology, 1960, 51, 245-254.

Holland, J.L. "Creative and academic performance among talented adolescents." Journal of Educational Psychology, 1961, 52, 136-147.

Holland, J.L., & Astin, A.W. "The prediction of the academic, artistic, scientific, and social achievement of undergraduates of superior scholastic aptitude." Journal of Educational Psychology, 1962, 53, 132-143.

Holland, J.L., & Nichols, R.C. "Prediction of academic and extracurricular achievement in college." Journal of Educational Psychology, 1964, 55, 55-65.

Holland, J.L., & Richards, J.M. "Academic and nonacademic accomplishment: Correlated or uncorrelated?" Journal of Educational Psychology, 1965, 56, 165-174.

Hoyt, D.P. "The relationship between college grades and adult achievement: A review of literature." Research Report No. 7. Iowa City, Iowa: American College Testing Program, 1965.

Hull, C.H., & Nie, N.H. (Eds.). Statistical package for the social sciences update 7-9: New procedures and facilities for releases 7-9. NY: McGraw-Hill, 1981.

Jackson, P.W., & Messick, S. "The person, the product, and the response: Conceptual problems in the assessment of creativity." Journal of Personality, 1965, 33, 309-329.

Jung, C.J. "Approaching the unconscious." in C.J. Jung (Ed.), Man and his symbols. Garden City, NY: Doubleday, 1964, pp.18-103.

Kagan, J. Creativity and learning. Boston: Houghton Mifflin, 1967.

Kagan, J. Understanding children. NY: Harcourt Brace Jovanovich, 1971.

Karlins, M. "Some empirical support for an exploration stage in the creativity process." Journal of Creative Behavior, 1968, 2, 256-262.

Kelley, T.R., Madden, R., Gardner, E.F., & Rudman, H.C. Stanford Achievement Test. NY: Harcourt Brace Jovanovich, 1965.

Kerlinger, F.N. Foundations of behavioral research. NY: Holt, Rinehart and Winston, 1973.

Kirkpatrick, E.A. "Individual tests of school children." Psychological Review, 1900, 7, 274-280.

Kirschenbaum, R.J. "Connecticut survey of identification procedures in gifted and talented education." unpublished study, Bureau of Educational Research, University of Connecticut, Storrs, CT., 1979.

Kirschenbaum, R.J. "From the attic: Editorial." Roeper Review, 1979, 2, 3-4.

Klinger, E. Structure and functions of fantasy. NY: John Wiley & Sons, 1971.

Koestler, A. The act of creation. NY: Macmillan, 1964.

Kogan, N. & Pankove, E. "Creative ability over a five-year span." Child Development, 1972, 43, 427-442.

Kohler, W. The mentality of apes. (Tr. by E. Winter.) NY: Harcourt, Brace & World, 1925.

Krebs, H.A., & Shelley, J.H. (Eds.) The creative person in science and medicine. NY:American Elsevier, 1975.

Krippner, S. "The ten commandments that block creativity." Gifted Child Quarterly, 1967,. us 11, 144-156.

Krippner, S., & Arons, M. "Creativity: Person, product, or process?" Gifted Child Quarterly, 1973, 17, 116-123; 129.

Kris, E. Psychoanalytic explorations in art. NY: International Universities, 1952.

Kubie, L.S. Neurotic distortion of the creative process. New York: Noonday, 1958.

Land, G. Grow or die: The principle of transformations. NY: Random House, 1973

Lieberman, J.N. Playfulness: Its relationship to imagination and creativity. NY: Academic, 1977.

Lombroso, C. The man of genius. London: Charles Scribner's Sons, 1895.

Lowenfeld, V. "Creativity: Education's stepchild." in S.J. Parnes & H.F. Harding (Eds.), A source book of creative thinking. NY: Charles Scribner's Sons, 1962, pp. 9-17.

Luchins, A.S. "Mechanization in problem-solving: the effect of Einstellung." Psychological Monographs, 1942, 54, #6.

MacKinnon, D.W. In search of human effectiveness: Identifying and developing creativity. Buffalo, NY: Creative Education Foundation, 1978.

Maddi, S.R. "Motivational aspects of creativity." Journal of Personality, 1965, 33, 330-347.

Maker, C.J. Providing Programs for the Gifted Handicapped. Reston, VA: Council for Exceptional Children, 1977.

Male, R.A., & Perrone, P. "Identifying talent and giftedness." Roeper Review, 1979, 2, 5-7.

Maloney, M.P., & Ward, M.P. Psychological assessment: A conceptual approach. NY: Oxford, 1976.

Maltzman, I., Bogartz, W., & Breger, L. "A procedure for increasing word association originality and its transfer effects." Journal of Experimental Psychology, 1958, 56, 393-398.

Maltzman, I., Simon, S., Raskin, D., & Licht, L. "Experimental studies in the training of originality." Psychological Monographs, 1960, 74, No. 6 (Whole No. 493).

Martinson, R. The identification of the gifted and talented. Ventura, CA: Ventura County Superintendent of Schools, 1974.

Maslow, A.H. "A holistic approach to creativity." in C.W.Taylor (Ed.), Climate for creativity: Report of the seventh national research conference on creativity. New York: Pergamon Press, 1972, pp.287-293.

Maslow, A.H. "Creativity in self-actualizing people." in A. Rothenberg & C.R. Hausman (Eds.), The creativity question. Durham, NC: Duke, 1976, pp.86-92.

Mauser, A. J. "Gifted handicapped committee chairman report." Report submitted to the Executive Committee of the Association for the Gifted, April 2, 1976.

May, R. The courage to create. NY: Norton, 1975.

McClelland, D.C. "Testing for competence rather than for 'intelligence.'" American Psychologist, 1973, 28, 1-14.

McKim, R.H. Experiences in visual thinking. Monterey, CA: Brooks/Cole, 1972.

McMullan, W.E. "Creative individuals: Pardoxical personages." Journal of Creative Behavior, 1976, 10, 265-275.

McNemar, Q. "Lost: Our intelligence. Why?" American Psychologist, 1964, 19, 871-882.

McPherson, J.H. "Environment and training for creativity." in C.W. Taylor (Ed.), Creativity: Progress and potential. NY: McGraw-Hill, 1964, pp.129-153. 1-14.

Mednick, S.A. "The associative basis of the creative process." Psychological Review, 1962, 69, 220-232.

Mednick, S.A. Remote Associates Test. Boston: Houghton Mifflin, 1967.

Mednick, S.A., & Mednick, M.T. "An associationistic view of creative thinking." in C.W. Taylor (Ed.), Widening horizons in creativity. NY: Wiley, 1964, pp.54-68.

Meeker, M. N. The structure of intellect: Its intepretation and uses. Columbus, OH: Charles E. Merrill, 1969.

Milgram, R.M., & Milgram, N.A. "Creative thinking and creative performance in Israeli students." Journal of Educational Psychology, 1976, 68, 255-259.

Mindell, P. "The gifted dyslexic: A case study with theoretical implications." Roeper Review, 1982, 4, 22-23.

Mondoni, M.S., & Tutko, T.A. "Relationships of academic achievement to incidental learning." Journal of Consulting and Clinical Psychology, 1969, 23, 558-560.

Mooney, R.L. "A conceptual model for integrating four approaches to the identification of creative talent." in S.J. Parnes & H.F. Harding (Eds.), A source book of creative thinking. NY: Charles Scribner's Sons, 1962, pp.73-84.

Moustakas, C. Creativity and conformity. NY: Van Nostrand Reinhold, 1967.

Munday, L.A., & Davis, J.C. "Varieties of achievement after college: Perspective on the meaning of academic talent." ACT Research Report No. 57. Iowa City, Iowa: Author, 1974.

Neisser, U. Cognition and reality: Principles and implications of cognitive psychology. San Francisco: W. H. Freeman, 1976.

Nicholls, J.G. "Creativity in the person who will never produce anything original and useful: The concept of creativity as a normally distributed trait." American Psychologist, 1972, 27, 717-726.

1980 census of population and housing: Connecticut. U.S. Department of Commerce, Bureau of the Census, PHD80-V-8.

Osborn, A. Applied imagination, (3rd ed.). NY: Scribners, 1963.

Otis, A.S., & Lennon, R.T. Otis Lennon Mental Ability Test. NY: Harcourt Brace Jovanovich, 1968.

Parloff, M.B., Datta, L., Klemen, M., & Handlon, J.H. "Personality characteristics which differentiate creative male adolescents and adults." Journal of Personality, 1966, 36, 528-552.

Parnes, S.J. "Education and creativity." Teachers College Record, 1963, 64, 331-339.

Parnes, S.J. "Creativity: Developing human potential." Journal of Creative Behavior, 1971, 5, 19-36.

Parnes, S.J. "Programming creative behavior." in C.W. Taylor (Ed.), Climate for Creativity: Report of the Seventh National Research Conference on Creativity. NY: Pergamon Press, 1972, pp.193-227.

Parnes, S.J. "AHA!" in I. A. Taylor & J. W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 224-248.

Parnes, S.J. "CPSI: The general system." Journal of Creative Behavior, 1977, 11, 1-11.

Parnes, S.J., Noller, R.B., & Biondi, A.M. Guide to creative action. NY: Charles Scribner's Sons, 1977.

Patrick, C. What is creative thinking? NY: Philosophical Library, 1955.

Pearson, P.H., & Maddi, S.R. "The similes preference inventory: Development of a structured measure of the tendency toward variety." Journal of Consulting Psychology, 1966, 30, 301-308.

Pegnato, C.W., & Birch, J.W. "Locating gifted children in junior high schools: A comparison of methods." Exceptional Children, 1959, 25, 300-304.

Perls, F., Hefferline, R.F., & Goodman, P. Gestalt therapy: Excitement and growth in the human personality. NY: Delta, 1951.

Piers, E.V., Daniels, J.M., & Quackenbush, J.F. "The identification of creativity in adolescents." Journal of Educational Psychology, 1960, 51, 346-351.

Plato. "Inspiration." in A. Rothenberg & C. R. Hausman (Eds.), The creativity question. Durham, NC: Duke, 1976, pp.31-33.

Poincare, H. "Mathematical creation." in H. Poincare, The foundations of science. NY: Science, 1913.

Prince, G.M. The practice of creativity. NY: Collier, 1970.

Prince, G.M. "The mindspring theory." Journal of Creative Behavior, 1975, 9, 159-180.

Rawson, M. B. Developmental language disability: Adult accomplishments of dyslexic boys. Baltimore: Johns Hopkins, 1968.

Rekdal, C.K. "In search of the wild duck: Personality inventories as tests of creative potential and their use as measurements in programs for the gifted." Gifted Child Quarterly, 1977, 21, 501-516.

Reese, H.W. & Lipsitt, L.P. Experimental child psychology. NY: Academic, 1970.

Reis, S. "An analysis of the productivity of gifted students participating in programs using the revolving door identification model." unpublished Doctoral Dissertation, School of Education, University of Connecticut, Storrs, CT, Dec. 16, 1981.

Rekdal, C.K. "In search of the wild duck: Personality inventories as tests of creative potential and their use as measurements in programs for the gifted." Gifted Child Quarterly, 1977, 21, 501-516.

Renzulli, J.S. The enrichment triad model: A guide for developing defensible programs for the gifted and talented. Mansfield Center, CT: Creative Learning Press, 1977.

Renzulli, J.S. "What makes giftedness? Reexamining a definition." Phi Delta Kappan, 1978, 60, 180-184; 261.

Renzulli, J.S. "Dear Mr. and Mrs. Copernicus: We regret to inform you..." Gifted Child Quarterly, 1982, 26, 11-14.

Renzulli, J.S., Smith, L.H., White, A.J., Callahan,C.M., & Hartman, R.K. Scales for rating the behavioral characteristics of superior students. Mansfield Center, CT: Creative Learning Press, 1976.

Renzulli, J.S., Reis, S.M., & Smith, L.H. The revolving door identification model. Mansfield Center, CT: Creative Learning Press, 1981.

Rhodes, M. "An analysis of creativity." Phi Delta Kappan, 1961, 42, 305-310.

Ribot, T. Essay on the creative imagination. NY: Arno, 1973. (Originally published, 1906.)

Rimm, S.B. GIFT: Group inventory for finding creative talent. Watertown, WI:Educational Assessment Service, 1980.

Rimm, S., & Davis, G.A. "GIFT: An instrument for the identification of creativity." Journal of Creative Behavior, 1976,10,178-182.

Rimm, S., & Davis, G.A. "Five years of international research with GIFT: An instrument for the identification of creativity." Journal of Creative Behavior, 1980, 14, 35-46.

Ripple, R.E., & May, F.B. "Caution in comparing creativity and IQ." Psychological Reports, 1962, 10, 229-230.

Rivlin, L.G. "Creativity and the self-attitudes and sociability of high school students." Journal of Educational Psychology, 1959, 50, 147-152.

Roe, A. The making of a scientist. NY: Dodd, Mead, 1952.

Roe, A. "Psychological approaches to creativity in science." in A. Rothenberg & C. R. Hausman (Eds.) The creativity question. pp. 165-175, 1976.

Rogers, C.R. Client-centered therapy: Its current practice, implications, and theory. Boston: Houghton, 1951.

Rogers, C.R. "Toward a theory of creativity." in S.J.Parnes & H.F. Harding (Eds.), A source book for creative thinking. NY: Scribner's, 1962, pp.64-72.

Rokeach, M. "The effect of perception time upon rigidity and concreteness of thinking." Journal of Experimental Psychology, 1950, 40, 206-216.

Rokeach, M. The open and closed mind: Investigations into the nature of belief systems and personality systems. NY:Basic, 1960.

Rosner, S.L., Adams, J.C., Daniels, P.R., & Schiffman, G.B. "Dealing with the reading needs of the learning disabled child." Journal of Learning Disabilities, 1981, 14, 436-448.

Ross, A.D. Psychological aspects of learning disability and reading disorder. NY: McGraw-Hill, 1976.

Rossman, J. The psychology of the inventor. Washington, D.C.: Inventors, 1931.

Rothbart, H.A. Cybernetic creativity. NY: Robert Speller & Sons, 1972.

Rothenberg, A., & Hausman, C. R. (Eds.) The creativity question. Durham, N.C.: Duke, 1976.

Sartre, J. The psychology of imagination. London: Methuen, 1972. (Originally published, 1940.)

Sattler, J.M. Assessment of children's intelligence. Philadelphia: W. B. Saunders, 1974.

Schachtel, E.G. "Perceptual modes and creation." in A. Rothenberg & C.R. Hausman (Eds.), The creativity question. Durham, N.C.: Duke University, 1976, pp.153-161.

Shapiro, R.J. "Creative research scientists." Psychologia Africana, 1968, Supplement No.4.

Simpson, R.M. "Creative imagination." American Journal of Psychology, 1922, 33, 224-235.

Singer, J. "The importance of daydreaming." Psychology Today, 1968, 1, 18-26.

Singer, J. "Fantasy: The foundation of serenity." Psychology Today, 1976, 10, 32-37.

Skinner, B.F. "A behavior model of creation." in A. Rothenberg & C.R. Hausman (Eds.), The creativity question. Durham, NC: Duke University, 1976, pp.267-273.

Spender, S. "The making of a poem." in B. Ghiselin (Ed.), The creative process: A symposium. Berkely, CA: University of California, 1952, pp. 112-125.

Stromer, W.F. "Poetry and encounter." Journal of Creative Behavior, 1977, 11, 261-263.

Stein, M.I. Stimulating creativity. NY: Academic, 1974.

Stein, M.I., & Meer, B. "Perceptual organization and the study of creativity." Journal of Psychology, 1954, 37, 39-43.

Storr, A. The dynamics of creation. NY: Atheneum, 1972.

Sutton-Smith, B. "The role of play in cognitive development." Young Children, 1967, 6, 361-370.

Task force report on identification: A primer on program Development for the gifted and talented. Hartford, CT: Connecticut State Department of Education, 1978.

Taylor, C. W. "The highest potentials of man." Gifted Child Quarterly, 1969, 2, 9-30.

Taylor, C.W., & Ellison, R.L. "Biographical predictors of scientitific performance." Science, 1967, 155, 1075-1080.

Taylor, C.W., & Holland, J.L. "Predictors of creative performance.' in C.W. Taylor (Ed.), Creativity: Progress and potential NY: McGraw-Hill, 1964, pp.15-48.

Taylor, I.A. "The nature of the creative process." in P. Smith (Ed.), Creativity: An examination of the creative process. NY: Hastings House, 1959, pp.51-82.

Taylor, I.A. A Theory of creative transactualization: A systematic approach to creativity with implications for creative leadership. Buffalo, NY: Creative Education Foundation, 1972.

Taylor,I.A. "A retrospective view of creativity investigation." in I.A. Taylor & J.W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 1-36. (a)

Taylor, I.A. "An emerging view of creative actions." in I.A. Taylor & J.W. Getzels (Eds.), Perspectives in creativity. Chicago: Aldine, 1975, pp. 297-325. (b)

Taylor, I.A. "Psychological sources of creativity." Journal of Creative Behavior, 1976, 10, 193-202.

Terman, L.M. & Merrill, M.A. Stanford Binet Intelligence Scale: Manual for the third revision, form L-M. Boston: Houghton Mifflin, 1960.

Thorndike, R.L., & Hagen, E. Measurement and evaluation in psychology and education (3rd ed.). NY: John Wiley & Sons, 1969.

Thorpe, L.P., Lefever, D.W., & Naslund, R.A. SRA Achievement Series, Chicago: Science Research Associates, 1968.

Thurstone, L.L. "Creative Talent." in L.L. Thurstone (Ed.), Applications of psychology. NY: Harper & Brothers, 1952, pp.18-37.

Tiegs, E.W., & Clark, W.W. California Achievement Tests. Monterey, CA: CTB/McGraw-Hill, 1970.

Torrance, E.P. Guiding creative talent. Englewood Cliffs, NJ: Prentice-Hall, 1962.

Torrance, E.P. Education and the creative potential. Minneapolis: University of Minnesota, 1963.

Torrance, E.P. Rewarding creative behavior. Englewood Cliffs, NJ: Prentice-Hall, 1965.

Torrance, E.P. Torrance tests of creative thinking: Norms technical manual. Princeton, NJ: Personnel Press, 1966.

Torrance, E.P. "Curiosity of gifted children and performance on timed and untimed tests of creativity." Gifted Child Quarterly, 1969, 13, 155-158.

Torrance, E.P. "Training teachers and leaders to recognize and acknowledge creative behavior among disadvantaged children." Gifted Child Quarterly, 1972, 16, 3-10.

Torrance, E.P. "Creatively gifted and disadvantaged gifted students." in J.C. Stanley, W.C. George, & C.H. Solano (Eds.), The gifted and the creative: A fifty year perspective. Baltimore: Johns Hopkins University, 1977, pp.173-186.

Torrance, E.P. "Unique needs of the creative child and adult." in A.H. Passow (Ed.), The gifted and talented: Their education and development The seventy-eighth yearbook of the National Society for the Study of Education - Part I. Chicago: University of Chicago, 1979, pp. 352-371. (a)

Torrance, E.P. The search for satori and creativity. Buffalo, NY: Creative Education Foundation, 1979. (b)

Torrance, E.P. "Growing up creatively gifted with learning disabilities." in W.M. Cruickshank & J.W. Lerner (Eds.), Coming of age. Syracuse, NY: Syracuse University, 1982.

Torrance, E.P., Bruch, C.B., & Morse, J.A. "Improving predictions of adult creative achievement of gifted girls by using autobiographical information." Gifted Child Quarterly, 1973, 17, 91-95.

Torrance, E.P., & Dauw, D.C. "Aspirations and dreams of three groups of creatively gifted high school seniors and comparable unselected group." Gifted Child Quarterly, 1965, 9, 177-182.

Treffinger, D.J. "Fostering independent learning." G/C/T, 1979, 7, 3-6;64.

Treffinger, D.J. "The progress and peril of identifying creative talent among gifted and talented students." Journal of Creative Behavior, 1980, 14, 20-33.

Treffinger, D.J., & Poggio, J.P. "Needed research on the measurement of creativity." Journal of Creative Behavior, 1972, 6, 253-267.

Treffinger, D.J., Renzulli, J.S., & Feldhusen, J.F. "Problems in the assessment of creative thinking." Journal of Creative Behavior, 1971, 5, 104-112.

Treffinger, D.J., Torrance, E.P., & Ball, O. "Guidelines for training creativity tests administrators and scorers." Journal of Creative Behavior, 1980, 14, 47-55.

Turvey, M.T. "Preliminaries to a theory of action with reference to vision." in R. Shaw & J. Bransford (Eds.), Perceiving, acting, and knowing. Hillsdale, NJ: Lawrence Erlbaum, 1977, pp.267-311.

Vran, F., & Pihl, R.O. "Selective attention deficits in learning disabled children: A cognitive interpretation." Journal of Learning Disability, 1980, 13, 387-391.

Wallach, M.A. "Creativity." in P.H. Mussen (Ed.), Carmichael's manual of child psychology, Vol. 1, (3rd ed.). NY: John Wiley & Sons, 1970.

Wallach, M.A. "Tests tell us little about talent." American Scientist, 1976, 64, 57-63.

Wallach, M.A., & Kogan, N. Modes of thinking in young children: A study of the creativity-intelligence distinction. NY: Holt, Rinehart & Winston, 1965.

Wallach, M.A., & Wing, C.W. The talented student: A validation of the creativity-intelligence distinction. NY: Holt, Rinehart & Winston, 1969.

Wallas, G. The art of thought. London: Watts, 1945. (Originally published, 1926).

Ward, W.C. "Reflection-Impulsivity in kindergarten children." Child Development, 1968, 39, 867-874.

Ward, W.C. "Creativity and environmental cues in nursery school children." Developmental Psychology, 1969, 1, 543-547.

Ward, V.S. The gifted student: A manual for regional improvement. Atlanta: Southern Regional Educational Board, 1962.

Warnack, M. Imagination. Berkeley, CA: University of California, 1976.

Wechsler, D. Manual for the Wechsler Intelligence Scale for Children - Revised. NY: The Psychological Corporation, 1974.

Wertheimer, M. Productive thinking. NY: Harper, 1945.

Werts, C.E. "The many faces of intelligence." Journal of Educational Psychology, 1967, 58, 198-204.

White, R.W. "Motivation reconsidered: The concept of competence." Psychological Review, 1959, 66, 297-333.

White, A.W., & Torrance, E.P. "The effects of psychomotor warm-up upon creative thinking in second grade." The Creative Child and Adult Quarterly, 1978, 4, 212-214.

Williams, R. L. "Abuses and misuses in testing black children." Counseling Psychologist, 1971, 2, 62-73.

Wilson, R.C. "Creativity." in N.B. Henry (Ed.), Education for the gifted: The fifty-seventh yearbook of the National Society for the Study of Education - Part II. Chicago: University of Chicago Press, 1958, pp.108-126.

Witkin, H.A., Moore, C.A., Goodenough, D.R., & Cox, P.W. "Field-dependent and field-independent cognitive styles and their educational implications." Review of Educational Research, 1977, 47, 1-64.

Witty, P.A.(Ed.) Reading for the gifted and creative student. Newark, Del.: International Reading Association, 1971. Yamamoto, K. "Creative thinking: Some thoughts on research." in J.C. Gowan, G. Demos & E.P. Torrance (Eds.), Creativity: Its educational implications. NY: John Wiley and Sons, 1967.

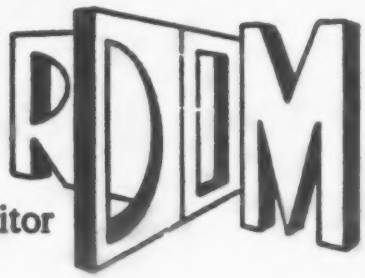
Yamamoto, K., & Chimbidis, M.E. "Achievement, intelligence, and creative thinking in fifth grade children: A correlational study." Merrill-Palmer Quarterly, 1966, 12, 233-241.

Zuckerman, M. & Link, K. "Construct validity for the Sensation-seeking Scale." Journal of Consulting and Clinical Psychology, 1968, 32, 420-426.

272

BUREAU OF
EDUCATIONAL RESEARCH
AND SERVICE

Technical Report of Research Studies Related to The Revolving Door Identification Model



Joseph S. Renzulli, Editor

2nd Edition, 1984
(ADDENDUM, 1985)

Research Report Series

School of Education
The University of Connecticut

184

A Technical Report of

Research Studies Related to

The Revolving Door Identification Model

Joseph S. Renzulli, Editor

Addendum, 1985

Part V: Administrators' Attitudes Toward Gifted Programs Based on The Enrichment Triad/Revolving Door Identification Model: Case Studies in Decision-making

By Carolyn R. Cooper

Part VI: Facilitator of Learning: A Micro-Ethnographic Study of the Teacher of the Gifted

By Carol M. Story

ADMINISTRATORS' ATTITUDES TOWARD GIFTED PROGRAMS BASED ON THE ENRICHMENT TRIAD/REVOLVING DOOR IDENTIFICATION MODEL: CASE STUDIES IN DECISION-MAKING

Carolyn R. Cooper, Ph.D.

Purpose of the Study

The purpose of this study was to examine the types of information school administrators require to make decisions about the nature and extent of services that should be provided for gifted and talented students. The study also examined administrators' perceptions of how the goals of a program for the gifted and talented could be evaluated, once articulated succinctly. A further area of investigation in this study addressed the goal of the Revolving Door Identification Model (RDIM) to integrate the gifted program into the total school environment, and to determine RDIM's flexibility to accommodate local needs and resources.

Methodology

This study sought evaluative information of a rich, descriptive nature which would lead to the framing of plausible hypotheses concerning school administrators' attitudes toward gifted programs using the Triad/RDIM. Such hypotheses would be based on the types of information deemed important in making policy decisions about use of the model in schools and districts.

The following research questions emerged from a thorough review of the literature and an examination of formative evaluation data recorded during the field-test period (1980-1982):

1. What types of information do administrators need to make decisions about the efficacy of gifted programs?

2. What are the service delivery goals (content, process, outcomes) of enrichment-based gifted programs?

3. What are the indicators of how well the gifted program fits into the total school curriculum?

4. How flexible is RDIM to accommodate local needs and resources?

Structuring the study was the Key Features Evaluation System (Renzulli, 1975), a presage or intrinsic evaluation approach which accommodates the unique features of gifted programming for which other models are inappropriate. Renzulli and Ward have used the presage approach more broadly in the development of the Diagnostic and Evaluative Scale for Differential Education of the Gifted (DESDEG: 1969) by pointing our several dimensions of a program that can be studied through the assessment of information that has an assumed relationship to the quality of the program (Renzulli & Smith, 1979).

Selection of Sample

The target population for this study comprised all 37 superintendents, principals, and directors of special education/pupil personnel services in eight Connecticut school districts which had field-tested RDIM during the 1980-81 and 1981-82 school years. Of the 37 administrators, 32 were accessible to the survey. For interviewing, only 28 were accessible.

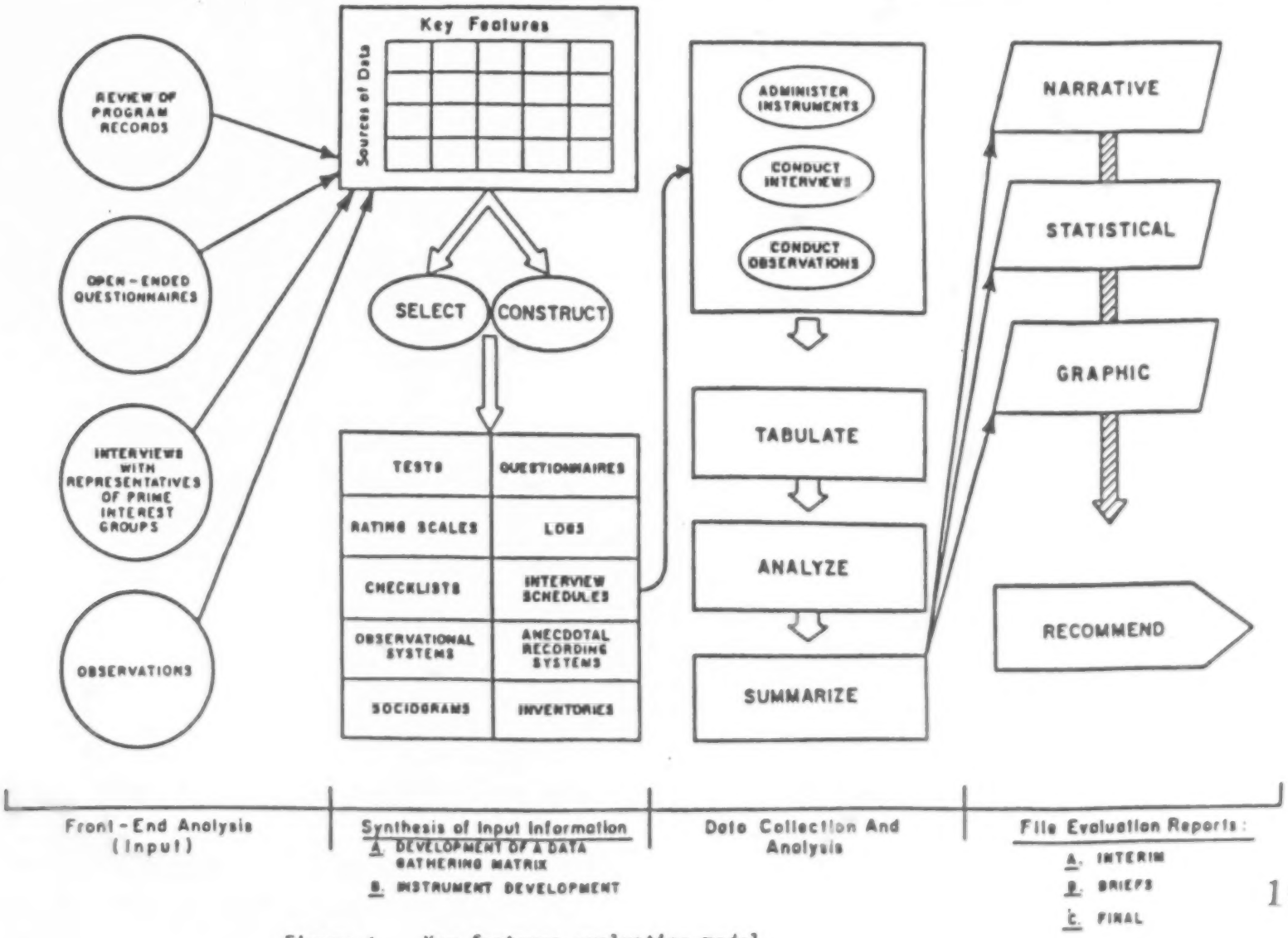


Figure 1. Key features evaluation model.

From the accessible population, a sample was drawn using administrative role as a stratifier to ensure representativeness within the three subgroups of administrative roles in the eight field-test districts. Administrators in each stratum of the sample were alike in the following three respects:

1. They were experienced in the area of gifted programming;
2. Either in the field-test district or elsewhere they had used traditional identification/programming techniques prior to the field-testing of RDIM; and
3. They had implemented RDIM in their schools since the field test.

They differed from other individuals within the general population of public school administrators in relation to their attitude about gifted programs based on Triad/RDIM.

Data Collection

Social science research is multi-paradigmatic (Rist, 1978). To study the process by which RDIM was adopted and adapted by each field-test district, the types of evidence required were primarily qualitative data. Data collection methods required an ethnographic approach.

Five major data sources were selected for gathering data for the study:

1. Administrators' survey (attitude questionnaire)
2. Personal interview of administrators
3. Hartley-Ferry Budget Decision Criteria Instrument
4. Program documents
5. Program observations

In addition, the researcher interviewed the TAG teacher informally following the program observation. A score was also recorded for each district on the Diagnostic and Evaluation Scale for Differential Education of the Gifted (DESDEG).

Data Analysis

Data for this study were analyzed by a variety of methods. Quantitative analysis of survey results and rankings of decision-making criteria were triangulated with analysis of the qualitative information collected through interviews. Analysis of program documents was triangulated with information yielded through on-site program observations and informal interviews with the TAG teachers.

The constant comparative method (Glaser & Strauss, 1967) of theory development was used as a basis for all data analysis. A complex procedure, this method required that distinct categories of information be identified and key issues coded accordingly. The constant comparative method of analyzing data was selected because of its ability to control the scope of data collecting and make multiple-site studies theoretically relevant (Bogdan & Biklen, 1982).

Six key features of the RDIM implementation process emerged from the front-end analysis information. They were necessary as links to critical variables affecting the degree of success each field-test district had experienced with the model. Key features are listed below:

- Attitudes toward program
- Identification and placement considerations
- Quality of service delivery
- TAG teacher's roles
- Program integration
- Decision-making criteria

A matrix of key features and sources of data appears in Figure 2.

Results

Research Question No. 1:

> What types of information do administrators need to make decisions about the efficacy of gifted programs?

Data Sources:

a. On-site interviews with 5 superintendents, 14 principals, and 3 special education/ pupil personnel directors

b. Hartley-Ferry Budget Decision Criteria Instrument (adapted)

All administrators interviewed said that information about program quality was of paramount importance to their decision-making with respect to program efficacy. The following five indicators of program quality emerged from each interview:

- Administrative Structure
- Client Attitudes
- Integration
- Program Goals
- Service Delivery

Sources of Data

	Key Features					
	Attitudes Toward Program	Identification and Placement Considerations	Quality of Service Delivery	TAG Teacher's Roles	Program Integration	Decision-Making Criterion
Superintendents	Annual Reports Interviews Open-ended questionnaires	Interviews Questionnaires			Questionnaires	Hartley-Ferry Rating Scale
Principals	Principal's Incident Reports Interviews Questionnaires	Principal's Incident Reports Interviews Questionnaires	Interviews School newsletter	Interviews	School's master calendar	Hartley-Ferry Rating Scale
Special Ed./ Pupil Personnel Directors	Interviews Questionnaires	Interviews		Interviews		Interviews
TAG Teachers	Interviews	Interviews Monthly reports	Daily schedules Observations DESDEG Interviews	Interviews Observations DESDEG	Interviews Observations DESDEG	
Program Records	Budget Publicity Notes from parents	Program description brochure Identification guidelines	Newsletters Letters to parents Activities log Written plan	Plan as approved by state dept. of Inservice descrip.	Student prog.rep. Stu's.compactors Acts. cal. Stu's. manage. plan	

Figure 2. Matrix of key features and sources of data.

Variables comprising each Program Quality Indicator (PQI) are shown below as well as the frequency with which each variable was mentioned by administrators in each role group. Note that the single variable "conceptual understanding" is included in three PQIs--Integration, Administrative Structure, and Service Delivery. Thus, only one-third the total frequency of administrators' references to their need to understand the concepts of RDIM are attributed to any one of these PQIs. Collectively, the references comprise a powerful variable to which administrators referred with great frequency across multiple aspects of program quality.

Variables Comprising Program Quality Indicators (PQIs) and Frequency of Variables as Identified In Interviews of Individual Superintendents (01), Principals (02), and Special Education/Pupil Personnel Directors (03)

PQI: Client Attitudes

Variable	01	02	03
Community support	20	8	4
Parent attitudes	17	37	2
Staff attitudes	12	47	21
Student attitudes	7	12	3
Board of Education attitudes	2	6	1
Administrative support	63	226	20

PQI: Integration

Variable	01	02	03
Preparation	10	30	6
Spillover	3	45	8
Administrative style	6	121	5
TAG teacher/classroom teachers relationship	4	40	7
Teacher accountability	3	26	1
Communication	15	35	7
Conceptual understanding	18	54	8
Public relations	17	46	2
Climate	2	44	6

PQI: Administrative Structure

Variable	01	02	03
Compacting	2	61	2
Product quality	2	13	5
Inservice	6	20	5
Individualization	4	13	2
Conceptual understanding	19	50	8
Decision-making responsibilities	8	8	1
Design of model	3	4	2
Politics	8	11	4
Articulation	1	0	1

PQI: Program Goals

Variable	01	02	03
More students	1	26	4
Less elitism	16	20	4
Radiation of excellence	0	4	1
Integration	11	47	6
Program accountability	14	9	0
Student achievement	5	9	0

PQI: Service Delivery

Variable	01	02	03
TAG teacher credibility	14	57	25
Conceptual understanding	20	53	8
Content not watered down	4	2	0
Program image/credibility	11	49	4

Client attitudes and integration (of the gifted program into the total school curriculum) are clearly the most important Program Quality Indicators (PQIs) to all administrator role groups interviewed--superintendents. principals, and directors of special education and/or pupil personnel. Central office administrators, i.e., the superintendent and special education director, ranked client attitudes their primary indicator of program quality. Principals appeared to rely chiefly on the nature and scope of a program's integration with the total school operation, turning to client attitudes second. Principals and superintendents in the sample reversed the importance of program goals and service delivery, and with respect to service delivery, special education directors ranked it third in importance. This role group, therefore, agreed with neither of the other role groups on the importance of service delivery information to making decisions about program efficacy.

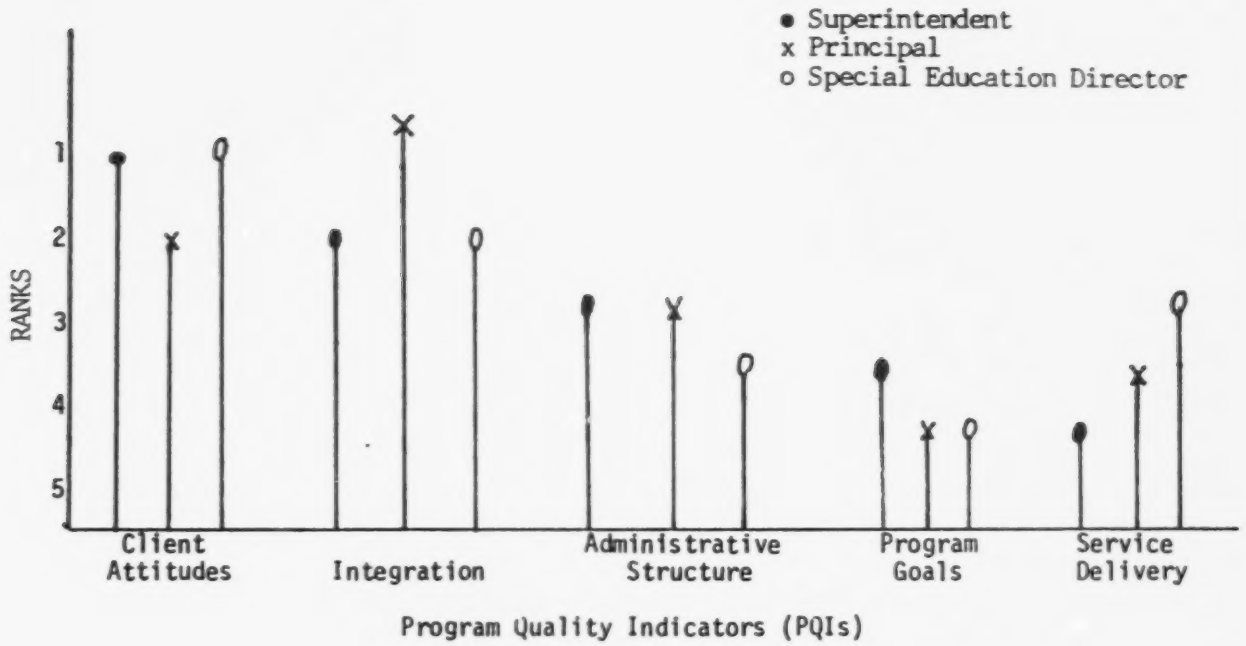


Table 1. Relative importance of program quality indicators (PQIs) to all superintendents, principals, and special education directors interviewed in eight field-test districts.

When ranks of program quality indicators were compared across superintendents, the patterns in Table 2 emerged.

While only one superintendent's ranks were congruent with the role group (criterion) rank, all subjects but one agreed that client attitudes and integration ranked highest in importance to their decision-making about program efficacy. The one dissenting superintendent ranked integration last.

TABLE 2

Relative Importance of Program Quality Indicators (PQIs) to Superintendents Interviewed by Field-Test District

PQI	Role Group Rank	Superintendents' Ranks by Field-Test District				
		2	5	6	7	8
Client Attitudes	1	1	1	1	1	1
Integration	2	2	2	2	5	2
Administrative Structure	3	4	4	3	2	3
Program Goals	4	5	3	4	4	5
Service Delivery	5	3	5	5	3	4

It appears that superintendents in the sample were concerned as is the general population of superintendents about constituents' attitudes. It would also appear that what services are provided students considered too specific and remote from superintendents' concerns (see Figure 3).

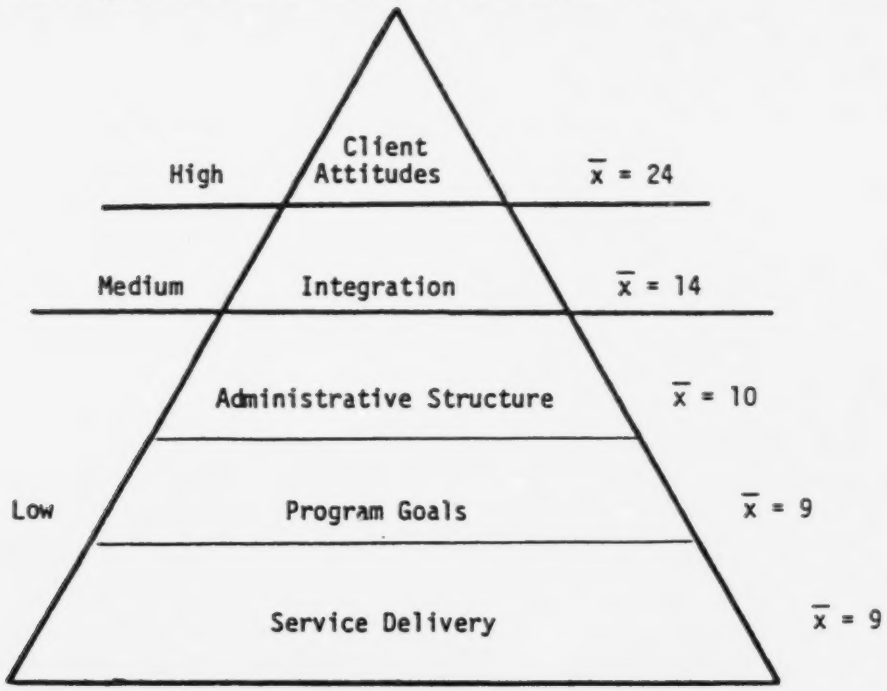


Figure 3. Program quality indicators as decision-making input for superintendents.

Ranks of Program quality indicators (PQIs) across the 14 principals interviewed were compared and results are presented in Table 3.

TABLE 3

Relative Importance of Program Quality Indicators (PQIs) to Principals Interviewed by Field-Test District

PQI	Role Group Rank	Principals' Ranks by Field-Test District													
		1		2	4		5			6	7		8		
		a	b	a	a	b	a	b	c	a	a	b	a	b	c
Client Attitudes	2	4	2	2	2	2	2	1	2	4	2	1	2	1	1
Integration	1	1	1	1	1	1	1	2	1	1	1	2	1	3	2
Administrative Structure	3	3	3	3	3	5	3	3	3	2	4	3	3	2	4
Program Goals	5	5	4	5	4	4	4	4	5	3	5	4	4	5	5
Service Delivery	4	2	5	4	5	3	5	5	4	5	3	5	5	4	3

Principals regarded the program integration process within their schools of prime importance while attention to client attitudes ranked second. The delivery of instructional services to students ranked in fourth place while actual program goals placed last (see Figure 4).

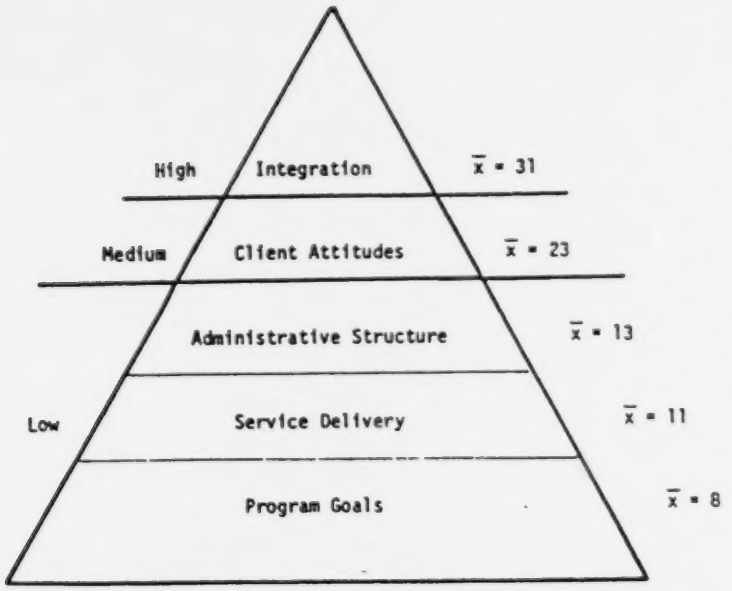


Figure 4. Program quality indicators as decision-making input for principals.

Directors, as with superintendents, ranked client attitudes and integration first and second, respectively. It would appear that central office administrators perceived the need to attend to their constituents' attitudes primarily when making decisions about program efficacy. However, directors are more like principals in their ranking of program goals least important in the decision-making process (see Figure 5).

Interviews with the three directors of special education and/or pupil personnel yielded the data in Table 4.

TABLE 4

Relative Importance of Program Quality Indicators (PQIs) to Directors Interviewed by Field-Test District

PQI	Role Group Rank	Directors' Ranks by Field-Test District		
		2	3	4
Client Attitudes	1	3	1	1
Integration	2	1	3	4
Administrative Structure	4	2	4	5
Program Goals	5	5	5	3
Service Delivery	3	4	2	2

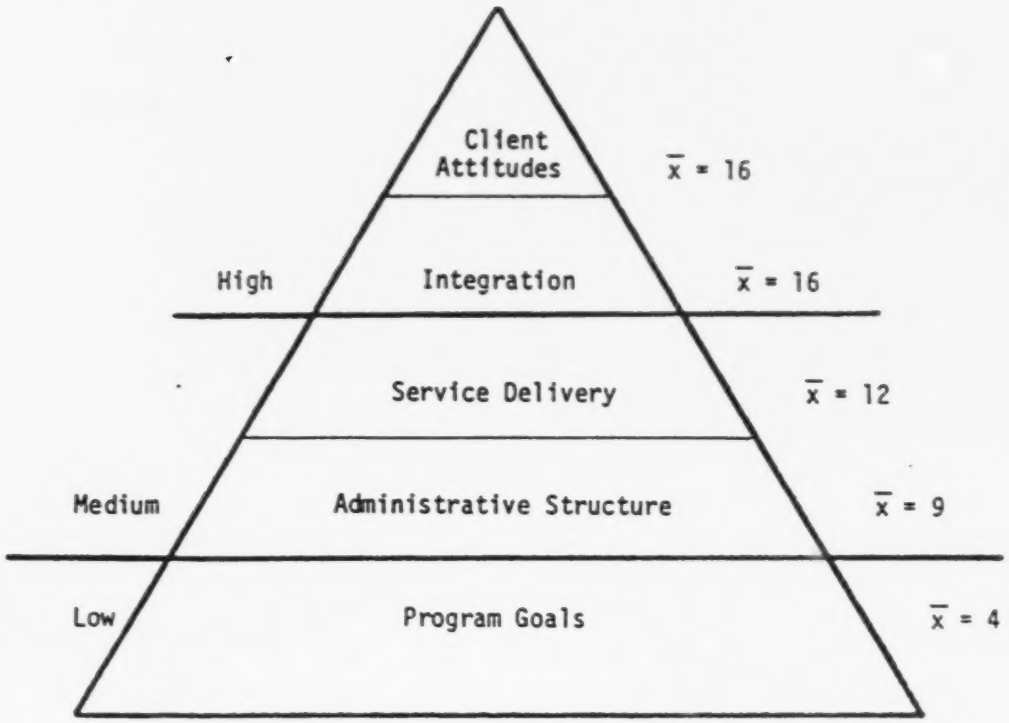


Figure 5. Program quality indicators as decision-making input for special education/pupil personnel directors.

The Hartley-Ferry Budget Decision Criteria Instrument was adapted for use in this study by making it situation-specific to gifted programs and inserted into the administrators' survey as item 33, as follows:

> 33. To what extent do these conditions with which you must deal influence your decision to initiate or continue a gifted program? Please rank order from 1-15 (1 = most important criterion in decision making).

The Instrument (see Summary below) was completed by one superintendent, 10 principals, and three directors of special education and/or pupil personnel for a total of 14 responses.

Hartley-Ferry Budget Decision Criteria Instrument (adapted)

Summary

To what extent do these conditions with which you must deal influence your decision to initiate or continue a gifted program? Please rank order from 1-15 (1 = most important criterion in decision-making).

Decision-Making Criterion[a]	01[b]	02[c]	03[d]
Non-Client Expenditures	___	___	___
Accreditation Standards	___	___	___
Administrator's Judgment and Intuition	___	4	5
Staff Recommendations and/or Needs Assessment	___	2	1
Internal-Organizational Political Pressures	___	___	___
National and Regional Curricular Trends	___	5	___
Principle of Least Opposition	___	___	___
Past Practice and Local Tradition	___	___	3
Impact of Matching Funds	___	___	___
External-Community Political Pressures	___	___	___
Number of Clients Affected	___	3	4
Program Quality and Evaluation Results	___	1	2
Collective Bargaining Contract Provisions	___	___	___
State and Federal Laws and Regulations	___	___	___
Governing Board Fiscal Policies	___	___	___
N of entries	1	10	3

[a]Only the five (5) highest-ranking criteria are reported for purposes of this study.

[b]Only one (1) superintendent completed the instrument. Thus, no ranks are recorded in the 01 column.

[c]02 = principals (N = 10).

[d]03 = special education/pupil services directors (N = 3).

Research Question No. 2:

What are the service delivery goals (content, process, outcomes) of enrichment-based programs for the gifted and talented?

Data Sources:

a. On-site observations of Triad/RDIM programs in each of the eight field-test districts in the sample (N = 10)

N.B. Two programs were observed in field-test districts 1 and 7 for the following reasons:

Field-test district 1 is a regional district. The 2 towns each have a program at the elementary level that participated in the 1980-82 field-test of Triad/RDIM.

Field-test district 7 contains the school where Triad/RDIM was piloted first. The researcher selected to observe this school's program as well as a randomly-selected program in this district.

b. On-site interviews with teachers of gifted programs observed (N = 10)

c. DESDEG analysis of each program observed (N = 10)

N.B. DESDEG = Diagnostic and Evaluative Scale for Differential Education of the Gifted

d. Program records

Participant observations focus on both events and the environment in which they occur (Bogdan & Taylor, 1975). In Triad/RDIM programs, events and the environment are interdependently woven into the model's design. Thus, the researcher observed both as critical complements within the service delivery aspect of the program observed.

In addition to the features included in the Program Observation Guide (Cooper, 1981) the researcher recorded notes to describe the physical layout of the resource room, the climate of the school building as well as the climate of the resource room itself, and the children's attitudes while present in the resource room. Events noted were Type I activities that had already transpired throughout the year, Type II process skills the students experienced, and evidence of Type III work, or advanced-level enrichment. Any other work or activity the children were involved in while in the resource room was recorded for future analysis, also. Finally, any TAG-teacher activity which involved bridging to the regular classroom, for instance, was indicated in the researcher's notes.

TABLE 5

Program Records Furnished by Field-Test Districts

	Document	Field-Test Districts (Ftd) 1	2	3	4	5	6	7	8	N	% of TOT
A	Prior Approval for SDE (1980-81, 1982-83)	1	0	1	0	0	1	1	0	4	50.0
B	Board of Ed. Policy on Gifted & Talented	0	0	0	0	1	0	0	0	1	12.5
C	Superintendent's Annual Report (1981-82)	1	1	1	1	1	0	0	0	5	62.5
D	Program brochures/other descriptive material	1	0	0	1	1	1	1	1	6	75.0
E	Press releases/publicity	1	1	0	0	1	1	1	0	5	62.5
F	Letter introducing program to parents	1	1	1	1	1	0	1	1	7	87.5
G	Identification guidelines	1	1	1	1	1	1	1	1	8	100.0
H	Student progress reporting methods	1	1	1	1	1	1	1	1	8	100.0
I	Description of inservice activities	1	1	0	0	0	0	0	0	2	25.0
J	Events involving parents, public	1	1	0	1	1	1	1	1	7	87.5
	Ftd Raw Score	9	7	5	6	8	6	7	5	53	66.3
	Percent Furnished	90	70	50	60	80	60	70	50		

1 - Furnished and reviewed

0 - Not furnished or reviewed

Interviews with the TAG teacher clarified events observed and explained any environmental factors not understood by simple observation. Unstructured interviews were approximately 30 minutes in length. The researcher posed questions generated from the program observation and later wrote a narrative report of the teacher's responses. This report was supplemented by a detailed description of the service delivery as observed and the environment in which observed events had occurred.

A brief examination of the three types of enrichment activities the eight field-test districts engaged in under the Triad/RDIM approach reveals the following points:

- Topics covered a wide range of interest areas.
- Science/Technology topics were favored among Type I enrichment activities (41 percent of the total sample).
- Fine Arts topics accounted for 22 percent of all Type I exploratory activities throughout the eight districts.
- Topics of historical nature accounted for 17 percent of all Type I activities.
- Type II enrichment was largely in the Fine Arts areas (44 percent of all activities). Process training occurred in areas as follows:
    - Literature (2)
    - Design (8)
    - Language (7)
    - Drama (2)
    - Debate/Logic (2)
    - Music (1)
    - Crafts/Avocations (1)
- Science/Technology was tied with Study/Research Skills and Thinking Skills for second most frequently occurring Type II training activities. Each of these areas represented 13 percent of the total Type II enrichment reported in the eight field-test districts.
- Individual and small group investigations (Type III) were generally science/technology-oriented (39 percent of Type III enrichment activities reported). Projects involving the Fine Arts accounted for 23 percent of the advanced-level enrichment.
- Several topics reported as Type I enrichment also appeared in other districts' lists of Type II activities. It would appear that there may be some clarification needed to distinguish the two types of enrichment. On the other hand, perhaps it is not the topic but the methodology employed which makes the distinction as to whether the enrichment activity is a Type I or II.

Figure 6 illustrates the major headings under which activities may be grouped to represent Types I, II and III enrichment as reported by the TAG teacher in each district.

Type I Enrichment Activities			Type II Enrichment Activities			Type III Enrichment Activities		
Category	N	%[a]	Category	N	%	Category	N	%
Science/ Technology	24	41	Fine Arts	23	44	Science/ Technology	29	39
Fine Arts	13	22	Science/ Technology	7	13	Fine Arts	17	23
History	10	17	Study/Research Skills	7	13	History	9	12
Social Issues	6	10	Thinking Skills	7	13	Social Issues	8	11
Communication	5	9	Communication	5	10	Communication	8	11
			Competitions	3	6	Psychology	4	6
TOT	58		TOT	52		TOT	75	

[a]Percents may not add to 100 because of rounding.

Figure 6. Major categories of Types I, II, and III enrichment as reported by the TAG teacher in each field-test district.

The last source of data examined for the answer to this research question was the DESDEG (Diagnostic and Evaluative Scale for Differential Education of the Gifted; Renzulli & Ward, 1969) analysis the researcher performed on each of the eight field-test districts' programs (see Figure 7).

In summary, Figure 8 shows the rankings of Program Requirements across the eight field-test districts. Of a possible perfect score of 8, a high score of 7.5 was obtained by two Program Requirements, Teacher Training and Functional Adequacy of the Organization. In second place Adequacy of Facilities and Teacher Selection tied with a score of 7, followed closely by Financial Allocation with a score of 6.5. It would appear that five statements could be offered to capture the essence of these rankings. These statements are as follows:

- Teachers in the Triad/RDIM programs observed were selected largely on the basis of their extraordinary abilities to guide children's learning rather than prescribe it; to provide sound direction to the program; to relate well with classroom staff; and to perform those administrative functions required of all TAG teachers.

	Key Feature	Program Requirement	Field-Test District 1*	2	3	4	5	6	7*	8
A.	Philosophy and Objectives	1. Existence and Adequacy of a Document	0	0	0	0	1	0	0	0
		2. Application of the Document	0	0	0	0	1	0	0	0
B.	Student Identification and Placement	3. Validity of Conception and Adequacy of Procedures	1	1	0	1	1	0.5	0.5	0.5
		4. Appropriateness of Relationship Between Capacity & Curriculum	1	1	1	1	0	0.5	1	0
C.	Curriculum	5. Relevance of Conception	1	1	0	1	0.5	0	0.5	0.5
		6. Comprehensiveness	0	1	0	1	1	1	0.5	1
		7. Articulation	0	1	1	1	0	0	1	0.5
		8. Adequacy of Instructional Facilities	1	1	1	1	1	0	1	1
D.	Teacher	9. Selection	0.5	1	1	1	1	1	1	0.5
		10. Training	0.5	1	1	1	1	1	1	1
E.	Program Organization and Operation	11. General Staff Orientation	0.5	1	0	1	0	1	1	1
		12. Administrative Responsibility & Leadership	0.5	1	0	1	1	1	1	0.5
		13. Functional Adequacy of the Organization	1	1	1	1	0.5	1	1	1
		14. Financial Allocation	1	1	1	1	0	0.5	1	1
		15. Provision for Evaluation	0	1	1	1	0	1	0.5	0.5
		DESDEG Score	8	13	8	13	9	8.5	11	9

*Combined (2 programs observed)

Figure 7. DESDEG analysis of each field-test district's program.

With respect to having the 15 Program Requirements in place, 50% of the districts scored at or above the mean of 9. Two of the 8 districts scored 13 and would have obtained a perfect score of 15 if a board of education policy had been established to guide their programs.

- The need for specialized training of TAG teachers is recognized by district administration who provides for inservice, conferences, and university coursework in annual budgets. By and large, TAG teachers in the ftds had taken several courses in teaching the gifted.

- District awareness of TAG is increasing steadily. Administrators reported fewer budget difficulties vis-à-vis the gifted program, and in all districts except ftd 6, instructional facilities appeared adequate.

- Programs appeared organized for effective operation, and in most districts program schedules had been designed to accommodate the school's needs.

- Only in ftd 5 was there a board of education policy on serving the gifted and talented. The disparity in philosophy in some of the other multiple-school districts might be attributed in part to the lack of direction from the district's governing board.

Research Question No. 3:

What are the indicators of how well the gifted program fits into the total school curriculum?

Data Sources:

a. On-site interviews with administrators

b. Administrators' attitude survey

c. Program records

d. Interview with TAG teachers

Nine variables defined the Program Quality Indicator (PQI) of Integration. These variables, together with the frequency (f) of references to them by administrators in the three role groups and the means of each group, are listed in Table 6.

From the initial analysis of findings with respect to principals' perceptions of program integration, the researcher hypothesized that one or more variables might account for differences observed among these subjects. To examine this possibility, the 14 subjects were divided into two groups whose populations were assumed to have equal means and equal variance. The two groups' perceptions of program integration were compared using a t-test.

After failing to accept the null hypothesis, the researcher sought to identify the variable(s) that accounted for the difference in means.

Key Feature	Program Requirement	Score	Rank Among Ftds
Teacher	Training	7.5	1
Program Organization and Operation	Functional Adequacy of the Organization	7.5	1
Teacher	Selection	7.0	2
Curriculum	Adequacy of Facilities	7.0	2
Program Organization and Operation	Financial Allocation	6.5	3
Program Organization and Operation	Administrative Responsibility & Leadership	6.0	4
Program Organization and Operation	General Staff Orientation	5.5	5
Curriculum	Comprehensiveness	5.5	5
Student Identification and Placement	Appropriateness of Relationship Between Capacity & Curriculum	5.5	5
Student Identification and Placement	Validity of Conception and Adequacy of Procedures	5.5	5
Program Organization and Operation	Provision for Evaluation	5.0	6
Curriculum	Articulation	4.5	7
Curriculum	Relevance of Conception	4.5	7
Philosophy & Objectives	Existence & Adequacy of a Document	1.0	8
Philosophy & Objectives	Application of the Document	1.0	8

Figure 8. Rankings of DESDEG program requirements across the eight RDIM field-test districts.

TABLE 6

Variables Comprising the Program Quality Indicator "Integration" and References to it by Administrators Interviewed

Variable	Superintendent f	Superintendent $\bar{x}$	Principal f	Principal $\bar{x}$	Director f	Director $\bar{x}$
Administrative Style	6	1.2	121	8.6	5	1.6
Administrator's Understanding of Program Concepts	18	3.6	50	3.5	8	2.6
Public Relations	17	3.4	46	3.2	2	.6
Spillover (Ripple Effect)	3	.6	45	3.2	8	2.6
School Climate	2	.4	44	3.1	6	2.0
TAG Teacher's Relationship with Staff	4	.8	35	2.5	7	2.3
Communication	15	3.0	35	2.5	7	2.3
Preparation for Program	10	2.0	30	2.1	6	2.0
Teacher Accountability	3	.6	26	1.8	1	.3

The following null hypotheses were advanced:

HO_1: There is no relationship between the amount of experience as a principal in the field-test district and the value which that administrator places on program integration.

HO_2: There is no relationship between a principal's level of understanding of RDIM's concepts and the value which that administrator places on program integration.

To test the first hypothesis, a rank-difference correlation was performed to determine whether or not the rank-order correlation coefficient was statistically significant.

The null hypothesis was accepted with respect to the possible relationship between years of a principal's experience in a district and the value he placed on program integration. The second hypothesis was tested using the Spearman rho to determine the existence of any significant relationship between the variables (see Figure 9).

$$\rho = 1 - \frac{6(130)}{14(195)} = 1 - \frac{780}{2730} = 1 - .285 = .715^{*}$$

*p = .01 The null is not accepted.

∴ There appears to be a relationship between program integration and an administrator's understanding of RDIM's concepts.

Figure 9. Rank-difference correlation technique applied to principals' conceptual understanding and value of program integration.

Once a relationship was apparent between the importance of program integration to principals and their understanding of RDIM's concepts, further analysis was possible. Data analyzed thus far were subsequently triangulated with principals' survey responses to seven specific items on the administrators' attitude survey.

The possibility of a relationship between a principal's integration index and his attitude toward critical issues RDIM sought to resolve was examined using a Chi-square analysis. The null hypothesis was retained.

It is the belief of the researcher that while there appears to be no relationship between a principal's integration index and his attitude toward certain critical issues underlying RDIM, two conditions present in this study confounded the analysis. First, the sample was not a random sample; subjects completing the survey were members of a distinct group of

school administrators who had field-tested RDIM for three years in their schools. Second, the sample size was very small. Only 10 principals responded to the survey.

Research Question No. 4:

How flexible is RDIM to accommodate local needs and resources?

Data Sources:

a. Interviews with administrators

b. Administrators' attitude surveys

Flexibility proved to be a more elusive characteristic to examine than integration, service delivery, or types of program quality information administrators need to make decisions about program efficacy. What were regarded as indicators of flexibility in one district were considered an aspect of the integration process in another. Hence, input to this research question was less structured than data analyzed for the first three questions. Responses appear to indicate that principals perceive RDIM to have the flexibility necessary to schedule time for Talent Pool students and to provide opportunities for individual Type IIIs when appropriate.

Three sets of data have been summarized. All data represent administrators' attitudes about one or more of the following aspects of RDIM:

A. Critical issues which have historically confounded attempts to measure the efficacy of gifted programs using traditional identification and programming approaches.

B. Key features administrators believe to have been responsible for the success of RDIM in their schools or districts.

C. Strengths administrators perceive in RDIM.

D. Aspects of the model which administrators believe could be strengthened.

A. Critical Issues

When the responses of all administrators completing the attitude survey were tabulated, the following percentages emerged. Indicated is how strongly administrators believe RDIM measures on ten critical issues.

Critical Issue	Percent of Responses: Strongly Agree	Agree	Disagree	Strongly Disagree	Unable to Judge
1. Involves more students	77	23	0	0	0
2. Minimizes elitism concerns	54	38	8	0	0
3. Results in more individual activities than whole-group learning	38	38	16	4	4
4. Relies upon classroom teachers' cooperation (action information & compacting)	23	62	12	0	3
5. Enlists more staff involvement	50	42	0	0	8
6. Raises fewer political concerns about who participates in TAG	89	11	0	0	0
7. Makes scheduling more flexible	41	47	0	0	12
8. Fosters more positive public relations	72	20	0	0	8
9. Is more easily integrated into total school curriculum	69	23	0	0	8
10. Promotes a "radiation of excellence" (Ward, 1962) throughout the school	68	20	0	0	12

B. Key Features Responsible for RDIM's Success

Principals and directors of special education and/or pupil personnel completed the administrators' attitude survey. Since only one superintendent completed the survey, analysis of data was restricted to data furnished by the former two role groups. The information which appears below, then, represents a summary of principals' and directors' responses from survey item #36 as follows:

> 36. What are the key features that you perceive to be responsible for the success of RDIM in a school or district?

Responses of principals appear separately from those of directors to facilitate association with the correct role group. Responses are also listed in descending order of frequency for easier analysis.

Principals' Responses

Support of parents	54%
Staff support	46
Professionalism of TAG teacher	38
Administrative support	31
Program coordinator's effort	23
TAG teacher's organizational skills	16
TAG teacher's enthusiasm	16
Involvement of key staff members	16
More student participation	16
Board of education support	16
Student interest	16

Responses of Special Education/Pupil Personnel Directors

More staff input	60%
Staff cooperation	60
Administrative support in all phases	40
Staff enthusiasm	40
Open and frequent communication with students, staff, parents	40

Item #37 asked administrators the following question:

37. What contribution has RDIM made to your school or district as a whole?

Principals' Responses

A new eagerness in students through their special projects	31%
Additional incentives for excellence through modeling professionals	23
Sharing of ideas with other schools	23
Positive public relations (visitors)	23
Positive effect on students' and teachers' attitudes	23
A fresh perspective: Classroom teachers now see other facets of their students	23
Meetings needs of bright children	16
Sharing Type I, II activities with the total school	16

Responses of Special Education/Pupil Personnel Directors

Sets a standard of quality	40%
Generates more community support	40%

C. Strengths of RDIM as Perceived by Administrators

In addition to their survey responses to critical issues that the Revolving Door Identification Model attempts to resolve, administrators offered input about the model's strengths through their interviews. The following outlines their observations of RDIM's strengths. Whether each feature represents a pedagogical issue or administrative concern (or both) is also indicated.

RDIM Feature Perceived as Strength	Pedagogical Issue	Administrative Concern
1. Promotes holistic approach to educating children (collaborates with total school, not with only 1 or 2 teachers)	X	
2. Encourages active parent involvement with TAG program		X
3. Student enthusiasm spills over to regular classwork		X
4. Makes critical impact on academic areas; strengthens regular classwork	X	

Strength of RDIM	Pedagogical Issue	Administrative Concern
5. Involves more staff with TAG		X
6. Serves more students than 5% model	X	
7. RDIM is a process designed by the local school for the local school. Needs and resources are built into its implementation while maintaining design fidelity		X
8. RDIM benefits the total school through Type I, II opportunities	X	X
9. Provdies a framework for an interdisciplinary approach to education, e.g., Triad-in-the-classroom	X	
10. School operates as a unit under RDIM; TAG is integrated, not separate entity	X	X
11. Enlists strong community support.		X
12. RDIM is its own best communicator: Success breeds success		X
13. Type III's emphasis on real problems requiring the student's commitment of time and effort gives students opportunities to stretch their abilities	X	
14. The fluidity of RDIM's design leads to an openness with respect to identification which, in turn, leads to a positive impact on the overall educational process through infusion	X	X
15. Infuses total school with a quality of excellence: High-quality student products create an aura that's critical and exciting	X	X
16. Gets more "mileage" out of an appropriately-trained TAG teacher		X

Strength of RDIM	Pedagogical Issue	Administrative Concern
17. RDIM is more defensible than 5% model	X	X
18. Reduces elitism		X
19. Stimulates staff thinking about individualizing educational experiences for all children	X	
20. Stimulates classroom teachers to learn more about bright students' abilities and how to excite children to apply them	X	

D. Aspects of RDIM Which Administrators Perceive as Areas to be Strengthened

Throughout every phase of data analysis the researcher recorded those aspects of RDIM which drew criticism from administrators whose attitudes were examined in this study. If the major purpose of program evaluation is to take action to improve its effectiveness (Alkin, 1979; Gable, 1980; Renzulli, 1975; Stufflebeam, 1969; Weiss, 1972), then it is critical that data be collected and analyzed which will provide direction for that improvement. Thus, as areas of concern surfaced through interviews with administrators, their reponses to the attitude survey, their rankings of decision-making criteria, and the researcher's examination of other data courses, those areas of concern were recorded and later analyzed.

The following five classifications represent all concerns raised by administrators across the three role groups -- superintendents, principals, and directors of special education and/or pupil personnel. Each problem area has been listed along with recommendations administrators offered to address it.

Problem Area	Administrators' Recommendations
1. Preparation for RDIM	a. Administrators and staff must be thoroughly knowledgeable of RDIM's concepts and operational implications.
	b. Administrators and staff must visit sites where RDIM has been implemented successfully before they launch their own program.
2. Communication	a. Involve classroom teachers in TAG plans.
	b. Keep all TAG's publics informed--especially, classroom teachers--with regular and frequent use of the school's communication vehicles.

3. Compacting	a. Be sure a child has demonstrated mastery of the basic skills of a content area before compacting his/her regular classwork.
	b. Assist teachers in learning to compact students' curriculum. As all teachers are not yet confident about compacting, be sure they do not require students to make up classwork missed while participating in TAG activities. This practice only penalizes children for TAG membership.
4. Teacher evaluation	a. Provide support for classroom teachers who are reluctant to let their students go to TAG because they fear poor student performance (on standardized tests, especially) will result from time spent out of their class.
	b. The evaluating administrator needs to develop an up-front openness with classroom teachers with respect to the role(s) they are expected to play in TAG. Teachers need reassurance that a possible shift in performance level of students with a compacted curriculum will not reflect negatively on their professional ability.
5. Scheduling	a. Stimulate students in the regular classroom to pursue their individual interests.
	b. Assert administrative leadership to facilitate the removal of students from regular classrooms to pursue those interests in the TAG room. Provide guidance services to allay students' apprehensions about missing content classes in order to participate in TAG.

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Conclusions and Implications

From the findings of this study the following conclusions were reached. They are general but provide the framework for the articulation of specific observations and recommendations for action. Gathering, analyzing, and disseminating information for decision-making is always directed toward action by decision-makers (Renzulli, 1975).

1. The goals of Revolving Door are both realistic and attainable.

2. Administrative leadership determines the level of excellence a school achieves.

3. How teachers are evaluated affects their willingness to compact curriculum.

4. "Differential Education for the Gifted" is a concept of service delivery which requires appropriate training to implement.

Recommendations

Following are several recommendations which the results of this study have generated. Each is presented as succinctly as possible and is accompanied by a brief statement of clarification. Recommendations for administrators:

Conclusion: RDIM's goals are both realistic and attainable.

1. Conduct workshops on Type III product quality: what to demand, how to stimulate it, and how to get it.

Workshops should be regularly-scheduled, devoted only to the issue of product quality, and provide ample opportunity for practical, hands-on application of what is learned.

2. Eliminate the "TAG" label from gifted programs.

Labelling automatically separates the program from the rest of the school curriculum, thereby defying one of the goals of RDIM itself. Every effort should be taken to encourage cohesiveness within the school. Labelling only one or two programs in the school bifurcates the totality into a "we" and "they" situation which threatens organizational health.

Conclusion: Administrative leadership determines the level of excellence a school achieves. Recommendations for administrators:

1. Undertake an evaluation of the organizational health in your school or district.

How open is the climate in the school or district? How do administrators perceive teachers? Are administrators primarily concerned with the task to be accomplished or with their staffs? How are teachers rewarded for their efforts?

These and other concerns should focus the study but not limit it. Staff relationships should also be examined as should the importance administrators place on self-evaluation as a means to professional growth.

2. Adopt a human resources model of management (Owens, 1981).

Caution must be issued against mistaking "human resources management" for "human relations management." (The latter was characteristic of school administration in the 1970's.) Human resources management, however, incorporates the best from the human relations style of administration but supersedes that style by focusing on collaborative problem-solving within a staff. The human resources model of management is recommended because it requires the development of cooperative staff relationships. It also emphasizes the need for continuous upgrading. Finally, the human resources model of management demands high-quality work from not only the students but the staff and administrators, as well.

It appears appropriate that RDIM serve as the catalyst for unlocking not only children's potential for excellence but the potential for excellence inherent in a school or district, also. RDIM's ability to facilitate communication within a school is documented by the current study. Cooperative staff relationships follow naturally. Therefore, if RDIM stimulates professional exchange among staff members and an esprit de corps develops around school goals, administrative leadership ensures that all special programs within the school or district will be integrated thoroughly for the benefit of all -- students, staff, and themselves.

Conclusion: How teachers are evaluated affects their willingness to compact curriculum. Recommendations for administrators:

1. Set a school goal of individualizing student instruction and include it in every teacher's evaluation plan.

"Individualization of instruction" is a phrase in educational jargon which is heard frequently but seldom observed in actual practice. Data collected in this study suggest that teachers who individualize student instruction also compact curriculum easily. Thus, to require each teacher to individualize instruction appears appropriate as a first step to compacting curriculum.

2. Assure every teacher that there will be no reprisal for an absence of grades for students whose curriculum has been compacted.

Administrators interviewed in this study reported that teachers were reluctant to compact a child's curriculum for several reasons. First, they thought they would lose control of that student's achievement. Second, teachers who were sensitive to pressures for students' high performance on end-of-year achievement tests believed that compacting might reduce a student's chances of doing well. A final concern was for their own evaluation. Missing grades for a child in an area which had been compacted for him or her might indicate negligence for which the teacher would be actionable. The combination of these fears generally prevented a teacher from compacting the curriculum at all.

3. Emphasize to staff that teaching is both an art and a science that "touches children's souls as well as their surfaces" (Eisner, 1983) and evaluate them on their synthesis of the two.

A synthesis of the art and science orientations needs to be adopted if teachers are to be evaluated more meaningfully. One approach that accomplishes the synthesis is the process of hermeneutical inquiry which makes sense of classroom phenomena the evaluator observes. The theory of practice (Sergiovanni, 1982) underlying this approach integrates the descriptive view of teacher evaluation (what is) and the normative (what ought to be) with an interpretive view, which gives meaning to events, and suggestions as to what supervisors and teachers should do (practice) to improve teaching.

Conclusion: Differential education for the gifted is a concept of service delivery which requires appropriate training to implement.
Recommendations for administrators:

1. Call upon the university's RDIM Evaluation Team to assist with your understanding of differential education for the gifted.

In his national survey of programs for the gifted, Gallagher and Weiss (1982) found that administrators perceived their greatest need to be inservice training. More than a one-day workshop, they emphasized, was needed to bridge their lack of understanding with respect to theories underlying gifted education. They also stressed the need for the inservice to be planned and continuous for optimum results. Inservice for classroom teachers, also, was articulated.

2. Draw attention to the crucial role of the teacher in every aspect of school learning.

Service delivery, the researcher believes, is defined thusly:

> The process of transforming a person's abilities and interests into new knowledge or new art.

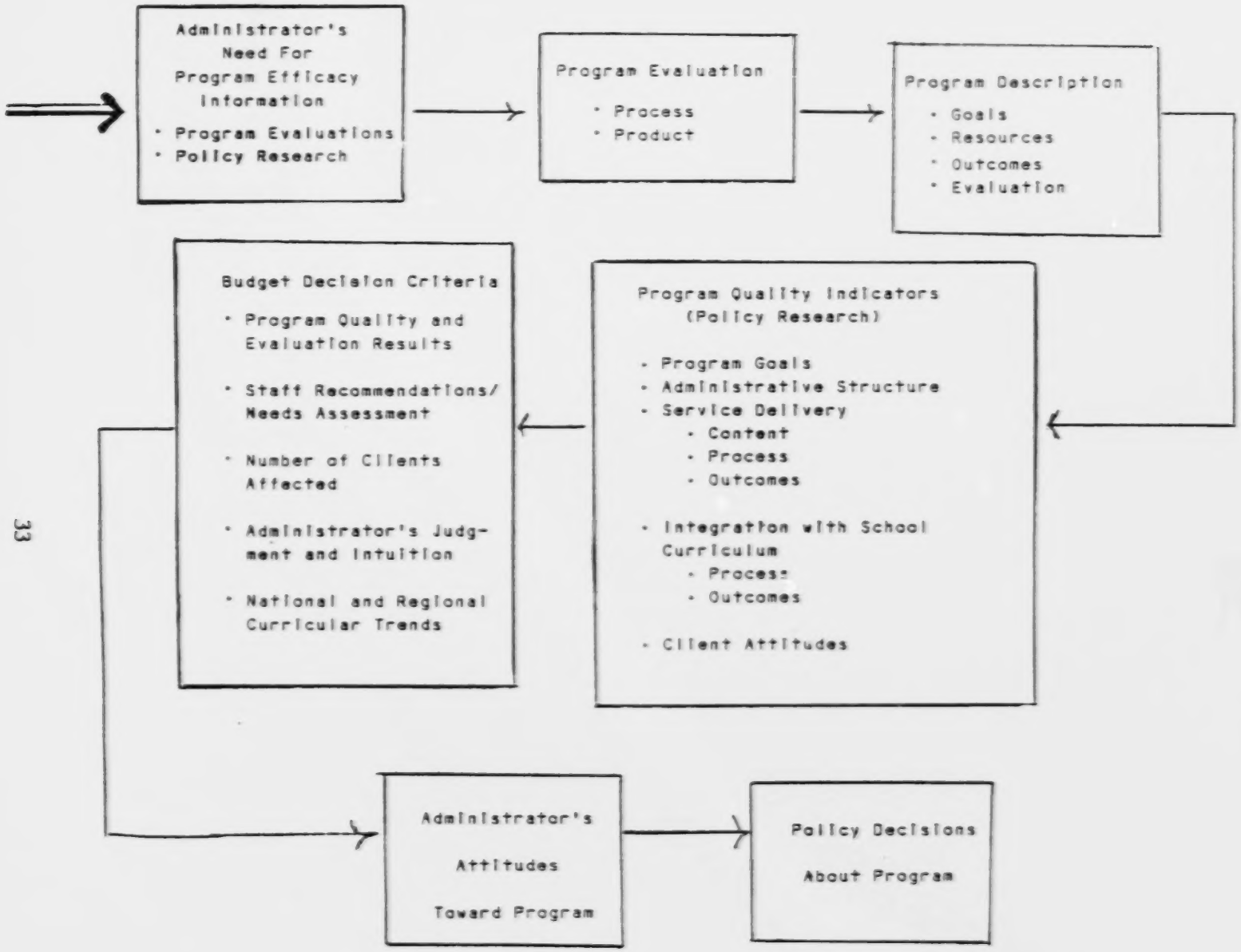


Figure 10. Cooper administrative decision-making model for evaluating program efficacy. Cooper, 1983

Data analyzed in the current study support this definition. They also place service delivery neatly between input and output as experienced in a learning situation. Grasping the essence of their own role in children's education is critical to the staff's understanding of differential education for the gifted. It is also necessary for their acceptance of the gifted program as appropriate and not elitist. Therefore, administrators should expend all efforts to emphasize the teacher's role in student learning.

Cooper Administrative Decision-Making Model for Evaluating Program Efficacy

The Cooper Administrative Decision-Making Model for Evaluating Program Efficacy (see Figure 10) was developed as a result of this study. To identify what information administrators needed to make enlightened decisions about program efficacy required both program evaluation and policy research. Programs were examined in the eight school districts that had field-tested the Revolving Door Identification Model (RDIM) from 1980 to 1982.

The program evaluation aspect of the study, i.e., an examination of process and outcomes, yielded a thorough description of each program studied. The policy research phase, on the other hand, produced a set of five indicators that administrators said they believed defined program quality. In addition, five criteria were identified as weighing more heavily than others in administrators' decision-making vis-à-vis initiating or continuing a gifted program.

Taken together, then, the need for specific data, knowledge of the program's dimensions, and an appreciation for the program's integrity as measured by valued decision-making criteria were perceived to contribute directly to an administrator's attitudes toward the program. It is these attitudes which shaped the policy decisions that administrators had made about their gifted program's use of the RDIM approach.

REFERENCES

Alkin, M., Daillak, R., & White, P. (1979). Using evaluations: Does evaluation make a difference? Beverly Hills, CA: Sage.

Bogdan, R., & Biklen, S. (1982). Qualitative research for education: An introduction to theory and methods. Boston: Allyn and Bacon.

Bogdan, R., & Taylor, S. (1975). Introduction to qualitative research methods. New York: John Wiley & Sons.

Cooper, C. (1981). The internship: A guide for graduate programs for the gifted and talented. Storrs, CT: Bureau of Educational Research

Cooper, C. (1983, May). How can you tell if your gifted program works? Paper presented at the annual Connecticut Update Conference on the Gifted and Talented, New Haven, CT.

Eisner, E. (1983). The art and craft of teaching. Educational Leadership, 40.

Ferry, M. H. (1981). An analysis of budget criteria, decision-making, experience of superintendents, and selected demographic characteristics of Connecticut school districts. Unpublished doctoral dissertation, The University of Connecticut.

Gable, R. (1980). Evaluating special education programs. West Hartford, CT: Associates in Professional Technologies.

Gallagher, J., & Weiss, P. (1982). Program effectiveness, education of gifted and talented students: A review. Report on Education of Gifted, Vol. 2. Chapel Hill, NC: University of North Carolina.

Glaser, B., & Strauss, A. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago: Aldine.

LeCompte, M., & Goetz, J. (1982). Problems of reliability and validity in ethnographic research. Review of Educational Research, 52.

Owens, R. (1981). Organizational behavior in education (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Renzulli, J. (1975). A guidebook for evaluating programs for the gifted and talented. Ventura, CA: Office of the Ventura County Superintendent of Schools.

Renzulli, J., & Smith, L. (1979). Issues and procedures in evaluating programs. In A.H. Passow (Ed.), The gifted and talented: Their education and development. Chicago: University of Chicago Press.

Renzulli, J., & Ward, V. (1969). Diagnostic and evaluative scale for differential education of the gifted. Storrs, CT: Bureau of Educational Research, The University of Connecticut.

Rist, R. (1978). On the means of knowing: Qualitative research in education. New York: New York University Education Quarterly.

Sergiovanni, T. (1982). Toward a theory of supervisory practice: Integrating scientific, clinical, and artistic views. In T.J. Sergiovanni (Ed.), Supervision of Teaching: ASCD Yearbook, 1982. Alexandria, VA: Association for Supervision and Curriculum Development.

Stufflebeam, D. (1969). Evaluation as enlightenment for decision-making. In W.H. Beatty (Ed.), Improving educational assessment and an inventory of measures of affective behavior. Washington, DC: National Education Association.

Weiss, C. (1972). Evaluation research: Methods of assessing program effectiveness. Englewood Cliffs, NJ: Prentice-Hall.

FACILITATOR OF LEARNING: A MICRO-ETHNOGRAPHIC STUDY OF THE TEACHER OF THE GIFTED

Carol M. Story, Ph.D.

The University of Connecticut

Introduction

This study examines the roles of six educators of gifted children, six people who are the leaders or guides for this specialized population. Using ethnographic research techniques, the study examines a portion of the role assumed by educators of the gifted-that of independent study. Analysis of data in the first phase of the study reveals patterns of behavior suggesting hypotheses for testing in the second phase. The study concludes with a summary of the behavioral characteristics of teachers of the gifted as they guide independent studies being executed by the children.

A number of studies dealing with personality characteristics of teachers of the gifted can be found in the literature. The most usual modes of the studies are intelligence testing and student ratings of the teachers (Bishop, 1966; Milgram, 1979). Several authors have suggested desirable traits for teachers of the gifted (Gowan & Bruch, 1967; Nelson & Cleland, 1971; Treffinger, 1975; Buttermore, 1979; Clark, 1979; Seeley, 1979; Schnur, 1980; Albert, 1981; Reis, 1982). Most efforts focused on (1) general personality characteristics and/or (2) characteristics that are unquestionably appropriate for all teachers (Renzulli, 1980; Reis, 1982).

One of the most often referenced studies of teachers of the gifted was done by Bishop in 1966. He analyzed characteristics of effective secondary teachers as assessed by gifted students. Students preferred teachers who were older and experienced. They saw the teachers possessing above average intelligence and enjoying intellectual pursuits. The teachers appeared to enjoy their profession and were respectful of other teachers and students. Their classes were stimulating and they believed in education for gifted students. Teachers were organized and student-centered (in Barbe & Renzulli, 1981, pp. 429-430). Another study of student perceptions by Milgram (1979) found that children were impressed by their teachers' creativity and positive personalities, but most valued their intelligence (p. 127). Torrance (1981) queried adults about successful teachers of the gifted. These adults remembered and valued those teachers who allowed creativity to grow and flourish and who were sensitive to individual differences and needs (p. 55). Several additional studies arrived at similar conclusions (Slaymaker, 1956; James, 1960; McNary, 1967; American Association for the Gifted, 1978; Flanagan, 1978; Cangemi, 1979; Borenson, 1981; Lewis, 1982; Webb, Meckstroth, & Tolan, 1982).

The characteristic most often designated as desirable for a successful teacher of the gifted is facilitator of learning. Additionally, traits such as flexibility, creativity, having a good self-concept, depth and breadth of knowledge, having a sense of humor, patience, abilities in counseling, maturity, experience in teaching, resourcefulness, and knowledge of the field of education for the gifted were most often noted

(Torrance, 1965; Gowan & Bruch, 1967; Gowan, Demos, & Torrance, 1967; Nelson & Cleland, 1971; Treffinger, 1975; Buttermore, 1979; Clark, 1979; Seeley, 1979; Lindsey, 1980; Schnur, 1980; Tuttle & Becker, 1980; Albert, 1981; Reis, 1982; Fleming & Takacs, 1983; Mulhern & Ward, 1983). In recent testimony before the National Commission on Excellence in Education, Kinsbourne (1982) suggested the teacher of the gifted should model the excitement of learning and discovery, be inspirational, and be an "example of a good mind functioning."

Virtually no research study has involved any direct observation of teachers of the gifted to discover the actual behavioral patterns that characterize them. The patterns include such things as a particular questioning technique, ways of suggesting outlets for student work, amount and kind of supervision, and many other aspects. The previously cited studies are quantitative in nature. A field as complex as teacher behaviors needs qualitative studies as well. This research undertook direct observations and related interviews as an initiator of that qualitative exploration.

The question guiding this study was: What are the behavioral characteristics of successful teachers of the gifted in their interactions with students involved in independent studies?

Method

The method of research for this study was ethnographic in nature, employing participant observation and interviews as the primary data gathering processes. Initially interviews were conducted with leaders in the field. Their opinions were solicited about the behavioral characteristics necessary for successful teaching of gifted children. Additionally, they nominated teachers best exemplifying those traits. Teachers had to be nominated at least twice to be elibible for this study. The six subjects were randomly selected from an available pool of 12.

The study proceeded in two major phases of field research. During the first phase two teachers were observed over a two month period, three or four times a week, for a total of 60-70 hours. Physical behaviors and movement was manually recorded and verbal interactions audio-taped. Transcriptions were made daily, along with analysis of those transcripts. At the end of the observation period, in-depth interviews were conducted with the teachers, selected students involved in the program, and their parents. Initial hypotheses were formulated based on these data.

Phase two of the study included observations of four more teachers over a two month period, along with the interview process as described in Phase One. Initial hypotheses were refined, tested, and supported with these additional data. Other researchers, trained in the qualitative paradigm, examined the data and agreed with 90 to 95 percent of the categories and properties established by the researcher.

Categorical support of observational data came from the several sources suggested above. The use of multiple sources is a technique

labeled triangulation. "Triangulation depends upon exposing a proposition to possibly countervailing facts or assertions" (Guba, 1978, p. 63). Analysis of all these data, along with a survey of the literature led to the conclusions of the study. This carefully planned series of observations, interviews, and literature search confirmed observed patterns and controlled for bias. The technique is grapically depicted in Figure 1.

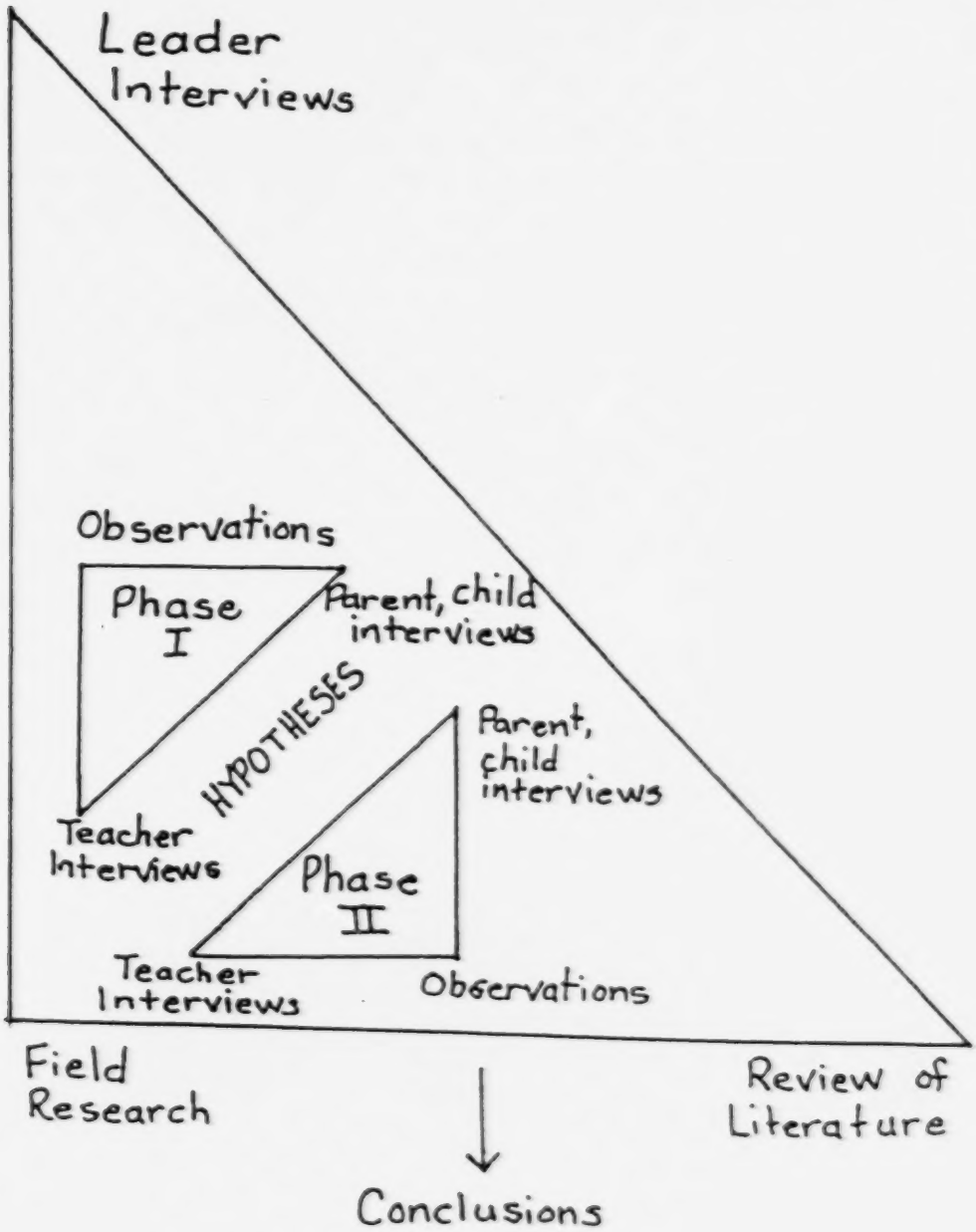


Figure 1. Triangulation of data.

Sites and Subjects

The population under study was six teachers of the gifted. They were located in rural, suburban, and urban schools in Connecticut with economic levels ranging from agricultural to upper middle class. The teachers had from three to nine years of experience in gifted education and six to fourteen years of experience in education altogether. All had Master's degrees or Sixth Year Certification which included course work in education for the gifted. Two of the teachers worked in programs that were developed by the staff; the other four were involved in Triad/ Revolving Door Programs (Renzulli, 1977; Renzulli, Reis, & Smith, 1981). Table 1 outlines each setting.

Table 1

Site and Subject Overview

Site	Setting	Economic Level	Years in gifted / Years in teaching	Highest Degree Earned	Program Model
A	Suburban	Middle class	9/14	C.A.G.S.	Staff developed
B	Rural	Middle class; Agri-cultural	8/10	M.A.+	Triad/ RDIM
C	Suburban	Upper middle class	8/8	M.A. (nearly)	Staff developed
D	Urban	Blue collar& middle class	4/7	M.A. (nearly)	Triad/ RDIM
E	Urban	Blue collar& middle class	3/6	C.A.G.S.	Triad/ RDIM
F	Rural	Upper middle class	8/12	M.A.	Triad/ RDIM

Discussion

The first step in Phase One of this research was to interview leaders in the field of education of the gifted. The interview data revealed four broad areas described as necessary characteristics for teachers of the gifted. These areas included: (1) professional commitment; (2) skills in facilitating learning; (3) knowledge in both general subject areas as well as in the theory of education of the gifted; and (4) personality factors. Essentially what leaders in the field described as successful were those teachers who do "the above and beyond kinds of things" (Vassar, p. 2). The facilitating skills and the personality factors listed were the same traits discussed in the previously reviewed literature.

After interviewing leaders in the field, the first phase of research was initiated at two sites as described above in the methodology. From this first phase of study, five categories of behavioral patterns emerged. These are: (1) physical behavior; (2) verbal interaction; (3) temporal relationships; (4) environmental/instructional modes; and (5) knowledge/involvement patterns.

With these categories in mind, initial hypotheses were formulated. Phase Two of the research tested these hypotheses over a two month period with four additional teachers of the gifted. A similar cycle of observations and interviews was undertaken with an openness to new patterns emerging. Six categories of behaviors with supporting properties as the parameters of the teacher's role in independent study were established. These are described below.

Hypothesis 1

Teachers of the gifted provide for positive and close physical relationships which support learning for gifted children.

1. The teacher of the gifted is within a four foot distance from a child when discussing the child's independent study.

From an "observer's comment": Whenever Chris talks with the children she sits near them, within a foot. There are also several diagrams of observations which indicate proximity, such as the following one.

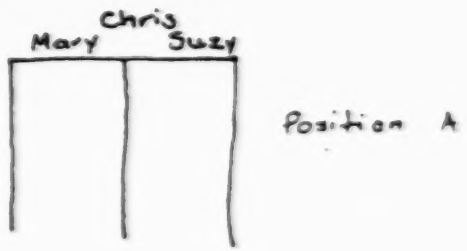


Figure 2. Proximity Diagram.

2. Discipline occurs most often at a distance of more than eight feet.

Again from an observer's comment: "Joey is across the room making quite a bit of noise while working on his video-taping skills for his Type III documentary." And then Bernadette comments from across the room, "Joey, don't you think that's a little distracting?"

3. The teacher of the gifted maintains continuous eye contact with the child and/or the object of study during the independent study process and discussion of that process.

For example, an observer's comment which says, "Bernadette is also listening carefully, with continuous eye contact on either the boys or William, their mentor."

4. Student and teacher are at the same eye level when discussing an independent study.

The observer's comment in this case reads, "Donna squats down behind the children as they work and helps them."

5. Touching is a technique used to emphasize enthusiasm for a child's project or for disciplinary reasons.

In one example, Donna pats a child on the back to encourage his participation with a "Good job" comment. In the other case, she takes a boy by the ear and says, "Has your mom ever taken you by the ear this way?" Since she has a broad smile on her face and suggests that the child get back to the work at hand, he laughs in response. The point is made and he returns to work.

The examples above are illustrations of many similar examples appearing in every teacher studied. The only one that was not often repeated was the last property; discipline is rarely a problem and there are only about a dozen examples of this sort.

Hypothesis 2

The quality and quantity of verbal interaction is a key factor in successful teaching of gifted children.

1. The teacher of the gifted employs verbal motivational patterns including acquiescence, encouragement or stimulation of work, encouragement of cooperation, and disciplinary statements.

Angela frequently comments on students' work; "You really are moving right along. That's marvelous." The other teachers also make those kinds of remarks at least once during a contact with a child working on an independent study on a given day. Sometimes they need to make the gentle reminder,

"You're disrupting other people's work. Please get back to work." The occasion for such a remark is very infrequent, not more than once an hour on an average on all the observations. Five of the teachers display the children's previous independent projects to stimulate interest in further projects; three also reinforce work with a point system or display of a checklist of completed work.

Chris stimulated Greg's work with the following comment.

> "Oh. I met someone in the post office yesterday who came up to me and said, 'A young gentleman came to talk with me recently. He'd done a lot of reading and had a lot of knowledge about his topic. I was really impressed with him.' I just thought you might like to know that. It was nice for me to hear also."

2. The teacher of the gifted displays a sense of humor.

All of the teachers have a good rapport with their students and often tease them. Donna talked with a student about a musical concept and ended with the following interchange.

> Peggy: I don't have a good ear.
>
> Donna: Sounds good to me (chuckle).
>
> Observer's comment: Everyone laughs.
>
> Peggy: Good ear, sounds good to me. Good pun, Mrs. D.

3. Teachers of the gifted ask many questions at the higher levels of Bloom's Taxonomy.

The transcripts were randomly sampled to examine types of questions asked. of 84 questions sampled, 49 percent were at the knowledge, comprehension, or application level of the Taxonomy. The remaining 51 percent were at the analysis, synthesis, or evaluation level. A Chi-square was computed to find the difference between the expected and observed cases of question types. It showed a significant difference in the levels of expected and observed questions, with the sixth level (evaluation) making a significant contribution to that difference (see Table 2).

4. Guided conferencing is a technique employed by the teacher of the gifted to focus and clarify independent study.

Flaurette talks with her Future Problem Solving Team and helps them prepare for the competitions.

> "You and your team members discuss and work on this together. That is pretty much the format. You'll have to do research on the topics, like this one of electronic games. You won't

know the real one until the real competition. We'll practice first in our school. I can't really help you. You work on your own with your team. We practice and train. So I thought you could look over the materials and think about them. And if there's anything else you're thinking about ask now."

Angela uses a similar technique.

> "I want you to do some thinking about these things. As you're reading along ask yourself some questions like 'What does it mean they frequently attached warriors from the top? How did they do that?' Or ask, 'How did they protect their heads.' Okay, and which book have you been using? Can we find others?"

All of the teachers use this sort of questioning at the initiation of the independent study, and as the children are in the midst of their research. At the conclusion of a study the aforementioned questions are asked.

Table 2

Chi-Square On Bloom's Levels

Level:	1	2	3	4	5	6
Observed:	24	13	4	8	5	30
Expected:	14	14	14	14	14	14
$O - E$	10	-1	-10	-6	-9	16
$(O - E)^2$	100	1	100	36	81	256
$\frac{(O - E)^2}{E}$	7.14	.07	7.14	2.57	5.79	18.29

$x^2 = 41$

$df = 5$, $cv_{.05} = 11.070$

Hypothesis 3

Teachers of the gifted are flexible with their use of time and scheduling according to students' needs.

1. The teacher of the gifted spends more time with students when focusing and concluding an independent study and less time checking on work in progress.

All of the teachers observed spend a great deal of time with students at the beginning of a study, helping to clarify and focus the child's topic of interest. They also spend a long time reviewing and discussing a finished product. During the middle of the independent study cycle, however, they move rapidly from one child to another; they may spend only a few moments "checking in" with children as they work. Figure 3 graphically displays this pattern.

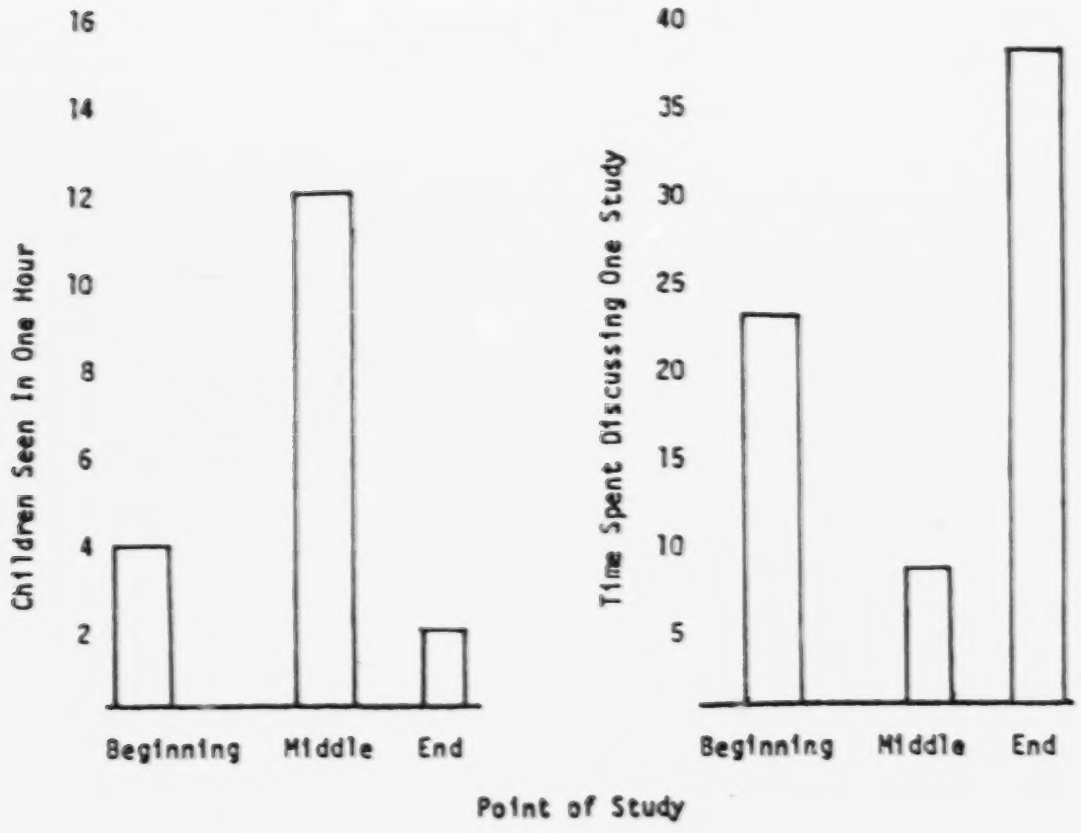


Figure 3. Transitions (IIIA) Graphically Displayed

2. There are varieties of response times to questions posed by the teacher of the gifted dependent upon the type of question.

Sometimes teachers ask rhetorical questions, or questions that allow no time for children to respons. Bernadette talks with a boy about his computer project asking, "So when it averages it what's it start doing with all the data? It's squashing it isn't it? Then what does it do?" Sometimes the questions are guiding children's thoughts as in Property II-4 presented above. At the end of a study, the teacher often poses a question which stimulates a child to discuss his/her independent study findings. For example, when Bernadette asked Bill, "What might have happened in the Civil War if the Battle of Gettysburg had turned out differently?" Bill speculated aloud for several moments in an answer to that.

3. Teachers of the gifted allow for alternatives in scheduling.

All of the teachers are willing to give the children any and every opportunity to work on independent study projects. Everett exemplifies this in the following:

> "Well, I'm not here on that day. But if you sit here by the doorway your teacher could see you. Someone has to be here with you, you can't come in alone. So she could watch you from across the hall while she teaches. It's good that you want to spend more time, Mary."

4. Teacher dominance of time and talk shifts to student dominance during the independent study process.

As seen in the first phase of study, teachers tend to talk a great deal during the initiation of a study. Children begin to do more talking and sharing as their own research begins to be completed. When they have become "masters" of their topics, they dominate the conversation. This is illustrated by the following model (See Figure 4).

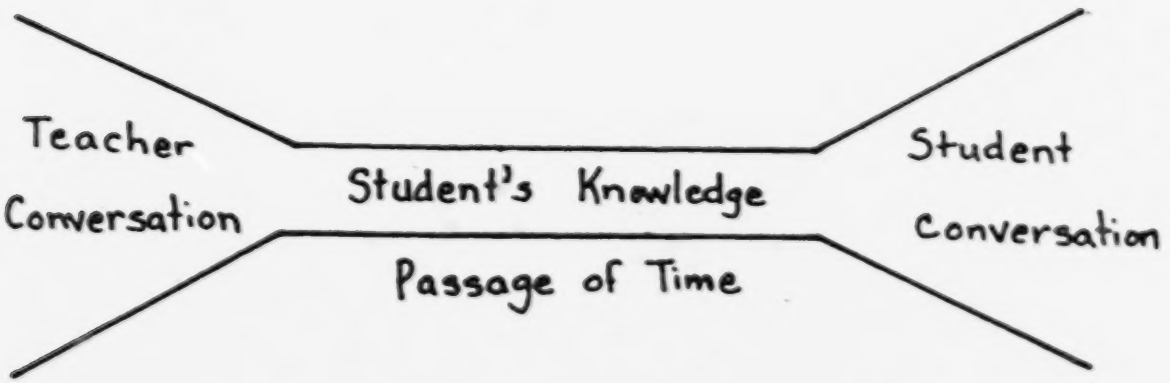


Figure 4. Conversation Patterns.

Hypothesis 4

Teachers of the gifted are process oriented with children's creative productivity the ultimate goal.

1. Independent studies are undertaken based upon a child's own interests and with the guidance of the teacher of the gifted.

All of the teachers believe that it is the child's interest that should motivate his/her independent studies. Donna exemplifies this in this interchange:

Donna: How did this all get started?

Katie: Well, first we all got together and we talked and you showed us some photographs.

Donna: Alright, first of all we had to build on your interest.

2. The teacher of the gifted provides for cognitive, affective, and creative development as related to the child's needs and those of the independent study the child undertakes.

In helping Joey develop his topic of psychic research, Chris makes suggestions for areas where he needs to build his general knowledge.

Chris: I think you need to write some of this down - like on the aura sheet [note-taking system] you need to describe the machine. Now what else is important? write down a definition if you need to. Can you have ESP without mental telepathy? Find out.

Joey: Well, they're sort of the same thing...

Donna demonstrates the concern for creativity as noted in an observer comment: "She makes a web of sorts as they talk, helping Julie see the various directions her interest in Laura Ingalls Wilder might take." A bit later in the same conversation, Donna considers Julie's affective side.

Donna: As far as writing, you might be able to pretend you're Laura, write some letters as if you were her during that time.

Julie: Cause I'll know her feelings by then.

Donna: Right!

3. Children are encouraged to develop responsibility by the teacher of the gifted.

Flaurette asks for help from one of her students in forming a debating team. "I think you may have a perspective of which kids would be good from your class discussions." Then she suggests he undertake the task of asking for the help. "And maybe you could speak with those kids and get them to join." He agrees. Or Bernadette exemplifies this issue when she reminds a child to assume responsibility for his own work. "You really look at it and analyze it and evaluate what you have here."

4. Record keeping is a role undertaken by the teacher of the gifted.

Everett encourages his students to complete Management Plans so they guides for their research study. "Now don't forget to fill in all the details and make a time line so you'll know how your work is going." Each teacher had some similar form to track children's studies.

5. The teacher of the gifted builds awareness of the interrelationships of various topics and ideas.

Many children had projects which involved several areas as interrelated to one topic. The children making the videotape documentary in Bernadette's room had to learn filming skills, plan for appropriate music, write the script, and be willing to "host" the program when it was produced. This interrelationship is built as the children work on their studies.

Donna: What else could you do with this study of Laura Ingalls?

Julie: Well, I could make a display of her life.

Donna: Could you do anything with your interest in archaeology?

Julie: Maybe I could make a pretend "dig" of things we might find around her house.

Donna: How can you use your creative writing abilities?

Many such conferences occur daily in the programs observed in this research.

6. Teachers of the gifted sometimes become involved in direct teaching during the independent study process.

The children are not always capable of understanding all the material they use to complete their independent studies and often need the help of the teacher. Everett typifies an often repeated scene. "Well, let's take a look and read this material on lasers. (They read the book together.) Well, let's see now, what that means is ...." He went on to explain to the child the subject the book had discussed. Or sometimes it is a matter of reminding children of what to do. Angela tells Jill, "So anyway what could we add to your note facts to make this clearer? To make it what it really should say? Try this."

7. Teachers of the gifted encourage creative productivity.

In each program, each teacher expects children to have an end product of their independent studies. Chris says,

> "That's another thing we'll be doing today when we the time. I have some things to show you to get you to start thinking about projects. So you might want to start one now. Just take a piece of paper and put projects at the top and put down the ones you have in your head and we can add to it later when we think of more."

Everett reminds his children:

> "Now the last thing we want on the Management Plan is your intended audience. When we do a Type III project we don't just sit it down and never look at it again. We want you to use it and share it. Maybe you could go on the TV show. Try it, be brave. It's hard, but ...."

Hypothesis 5

Teachers of the gifted provide or suggest appropriate environmental supports based upon children's independent study interests.

1. Resources are multiple and varied as encouraged and arranged by the teacher of the gifted.

Burnadette reminds John:

> "Alright. This is a program you wrote in chronobiology and the kids have to read the article and then try to do it. After the article and research what do you need to do? Where could you get help?

Or Donna who reminds Julie:

> "You can go to the library and check out all the Laura books. Or you can see if the bookstore has that book of her letters. And I'll look at the university library."

Each teacher does this sort of encouraging and accessing for the children.

2. The teacher of the gifted is able to access both physical and human resources to meet the needs of the children in the resource room.

Flaurette is a good example of this sort of resource development as seen in the following observer's comment:

"It is important to note that Flaurette was a debater during her college days. She uses a local lawyer as a mentor to do this project, also. She also uses the resources of a local politician. The students eventually enter the debate competition held at the state level and sponsored by the League of Women Voters."

Hypothesis 6

The teacher of the gifted displays "gifted behavior" as brought to bear upon his/her professional responsibilities.

1. The teacher of the gifted has a wide range of knowledge on many topics.

This property becomes apparent in observer's comments. "Increasingly I am aware of Angela's knowledge. Today she was naming rocks, working with medieval history, and talking about dolphins." Each teacher knows something about each project underway in the resource room.

2. The teacher of the gifted accepts his/her own limitations.

Teachers are not afraid to admit to students when they did not know about a given topic. Bernadette suggested to Joey, "Well, I don't know how to do that on the computer, but maybe you could call Mrs. Kinney and ask for her help." The teachers all have a resource person or knowledge of where and how to seek necessary help when a child comes to them with seemingly unsolvable problems.

3. The teacher of the gifted possesses both an academic and personal knowledge of his/her children.

The teachers were always careful to mention to the researcher that a child had a certain IQ score or was especially good in some given area. They also knew the children's concerns or current involvements. For example, Donna to John: "Well, these books that John got for his birthday are super and if you're real nice to him he might let you look at them. They're all about his interest in astronomy." Or Flaurette addressing Sally says, "Maybe you could do a poem for the literary magazine. I know you write good ones."

4. The teacher of the gifted becomes personally involved with students.

Sometimes teachers were involved in immediate responses to issues, as when Bernadette notices Lisa's health.

Bernadette: Are you feeling alright today? Are you a little tired?

Lisa: Yeah.

Bernadette: What's the matter?

Lisa: I have a headache.

Sometimes the issues are more involved and the teachers become counselors.

> Angela: Well, how can we help you get your work done? What do you want to do about it?

The counseling role was mentioned by each teacher as an important one when they were interviewed in the research process.

5. The teacher of the gifted is involved in many activities professionally and personally which support his/her professional role.

Each site description contains data related to the teachers' involvement. They are authors, consultants, political activists, curriculum developers, artists, debaters, and so on. The activities help them find mentors, expand their programs, find new outlets for products, and generally better serve and work with the children in the program.

6. The teacher of the gifted is continually striving to provide more for the students.

The teachers not only are active themselves and pursue their own interests; interviews reveal that they are always "taking another course" or "going to a conference." They often ask children to help develop resources. Everett asked, "Do you think that your friend would come and speak to the class about her interest in Indians?"

7. The teacher of the gifted is isolated from professional peers because of his/her unique role.

Four of the teachers in this study are the only teachers of the gifted in their buildings; Angela has a partner and Chris is a member of a team of five teachers of the gifted. The others speak often in their interviews of not having anyone with whom to share ideas or from whom to get ideas for further growth, personally and professionally.

8. The teacher of the gifted is creative in developing curriculum and ideas for creative productivity.

Each teacher in this study has many ideas for creative productivity on the part of the students as discussed in Property IV-6. Five of the six are also published authors in their own right, curriculum developers, consultants, poets, or artists.

Conclusions

The role of facilitator of independent studies is only one of four assumed by a successful teacher of the gifted. This conclusion comes from the review of the literature, the interviews of leaders in the field, and teachers' own perceptions. In addition to the ability to guide independent studies, the leader interviews and literature review suggested teachers of the gifted must possess the characteristics of good teachers in general,

must have highly developed management skills, and must be competent in-service presenters. The results of all the interviews (leaders in the field, teachers, children, parents) and of the review of the literature support the sixth category of the above findings-the teacher displayed gifted behavior. Those sources suggested that it is the above average, creative, and task committed teacher that can learn the above defined roles. Gifted behavior brought to bear upon the teacher's professional role will lead to creative productivity in that role. The ultimate product will be better programs for gifted children (see Figure 5).

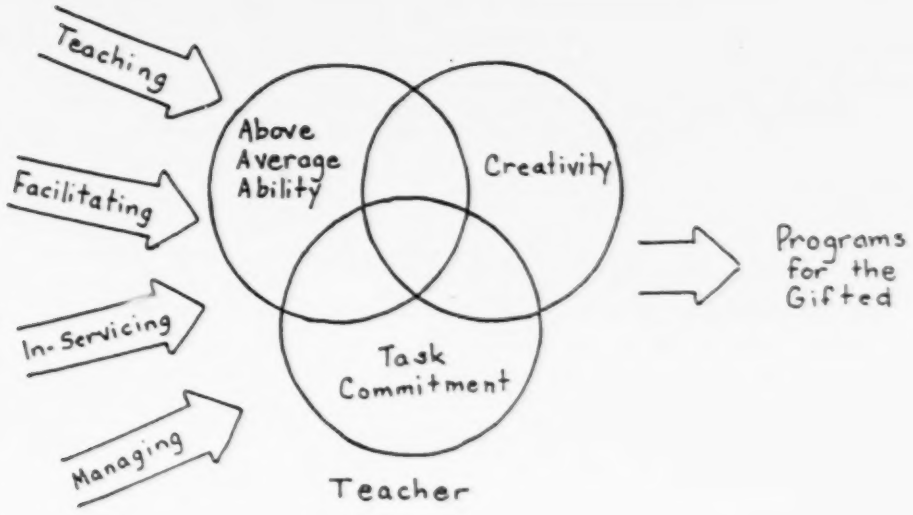


Figure 5: Theoretical Model - Roles of the Teacher of the Gifted

The above defined behaviors of teachers of the gifted guiding children's independent studies are useful in several areas. They will serve as guidelines for administrators hiring new staff and evaluating current staff in programs for the gifted. They are also useful in pre-service training programs as well as categories for competency-based certification procedures. Finally, the research methodology is a useful tool for both educational researchers and gifted children conducting independent studies.

This research began with the goal of discovering the behavioral characteristics of successful teachers of the gifted as they interacted with students involved in independent studies. Those behaviors, listed above, contributed to the model of the role of a teacher of the gifted. Teachers of the gifted choosing to employ these behaviors will provide better opportunities for gifted children. The will become the teachers who make the difference.

REFERENCES

Albert, R. S. Special programs require special people. Roeper Review, 1981, 4(2), 2-4.

American Association for Gifted Children. On being gifted. New York: Walker & Co., 1978.

Barbe, W. B. & J. S. Renzulli. Psychology and education of the gifted. New York: Irvington Publishers, Inc., 1981.

Bishop, W. E. Characteristics of teachers judged successful by intellectually gifted, high-achieving high school students (Doctoral dissertation, Kent State University, 1966). Dissertation Abstracts International, 1967, 28, 2, 487A-488A.

Borenson, H. Promoting mathematical creativity in the classroom. Educational Forum, 1981, 45(4), 471-476.

Buttermore, P. H. Arts in gifted education. Gifted Child Quarterly, 1979, 23(2), 405-414.

Cangemi, J. P. How culturally different, gifted, and creative students perceive their teachers. Clearing House, 1979, 52(9), 419-420.

Clark, B. Growing up gifted: Developing the potential of children at home and at school. Columbus: Charles E. Merrill, 1979.

Flanagan, J. C. Perspective on improving education: Project TALENT's young adults look back. New York: Praeger, 1978.

Fleming, E. S. & C. Takacs. A multidimensional model for educating teachers of the gifted and talented. Roeper Review, 1983, 6(1),22-26.

Gowan, J. C. & C. Bruch. What makes a creative person a creative teacher? Gifted Child Quarterly, 1967, 11(3), 157-159.

Gowan, J. C., G. D. Demos, & E. P. Torrance. Creativity: It's educational implications. New York: John Wiley & Sons, Inc., 1967.

Guba, E. G. Toward a methodology of naturalistic inquiry. Center for Studies in Evaluation Monography Series in Evaluation, 1978.

James, K. G. The preparation of teachers for the gifted in the elementary schools: A special reference to Southern Connecticut State College (Doctoral dissertation, New York University, 1960). Dissertation Abstracts International, 1961, 21, 10, 3005-3006.

Lewis, J. F. Bulldozers or chairs? Gifted students describe their ideal teacher. G/C/T, 1982, 23, 16-19.

Lindsey, M. Training teachers of the gifted and talented. New York: Teachers College Press, 1980.

McNary, S. B. The relationship between certain teacher characteristics and achievement and creativity of gifted elementary school students. Washington, D.C.: United States Department of Health, Education, and Welfare, 1967. (ERIC Document Reproduction Service No. ED 015 787).

Milgram, R. M. Perception of teacher behavior in gifted and non-gifted children. Journal of Educational Psychology, 1979, 71(1), 25-28.

Mulhern, J. D. & M. Ward. A collaborative program for developing teachers of gifted and talented students. Gifted Child Quarterly, 1983, 27(4), 152-156.

National Commission on Excellence in Education (October 15, 1982; remarks of Dr. Marcel Kinsbourne).

Nelson, J. B. & D. L. Cleland. The role of the teacher of the gifted and creative children. In Barbe, W. B. & J. S. Renzulli (Eds.), Psychology and education of the gifted. New York: Irvington Publishers, 1981.

Reis, S. M. Letter to a parent. Gifted Children Newsletter, 1982, 3(12), 17-18.

Renzulli, J. S. The enrichment triad model: A plan for developing defensible programs for the gifted and talented. Mansfield Center, CT: Creative Learning Press, 1977.

Renzulli, J. S. Will the gifted child movement be alive and well in 1990? Gifted Child Quarterly, 1980, 24(1), 3-9.

Renzulli, J. S., S. M. Reis, & L. H. Smith. The revolving door identification model. Mansfield Center, CT: Creative Learning Press, 1981.

Schnur, J. O. Teachers for the gifted - past, present, and future. Roeper Review, 1980, 2(4), 5-7.

Seeley, K. R. Competencies for teachers of gifted and talented children. Journal for the Education of the Gifted, 1979, 3(1), 7-13.

Slaymaker, J. E. Current instructional techniques used in classes for mentally gifted children in Indianapolis, Cleveland and other elementary schools (Doctoral dissertation, University of Colorado, 1956). Dissertation Abstracts International, 1957, 18, 1744-1745.

Torrance, E. P. Rewarding creative behavior: Experiments in classroom creativity. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1965.

Torrance, E. P. Predicting the creativity of elementary school children (1958-80) - and the teacher who "made a difference." Gifted Child Quarterly, 1981, 25(2), 55-62.

Treffinger, D. J. Teaching for self-directed learning: A priority for the gifted and talented. Gifted Child Quarterly, 1975, 19(1), 46-59.

Tuttle, F. B. & L. A. Becker. Program design and development for gifted and talented students. Washington, D.C.: National Education Association, 1980.

Vassar, W. Consultant for Gifted and Talented Education. State of Connecticut, Hartford, CT: Interview, March 8, 1983.

Webb, J. T., E. A. Meckstroth, & S. S. Tolan. Guiding the gifted child: A practical source for parents and teachers. Columbus, Ohio: Ohio Psychology Publishing Co., 1982.